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METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

JANUARY, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years in Newfoundland and Prince Edward Island, and in parts of Nova Scotia, New Brunswick and Quebec; elsewhere it was slightly below the normal.

The month opened with a marked trough of low pressure extending from Lake Superior southward across the Mississippi Valley, accompanied by generally mild and rainy weather while abnormally high pressure covered Eastern Canada and the Atlantic States, and also Manitoba and the Northwest Territories, in this latter area the temperature ranging from 20° to 40° below zero. The cyclonic movement occurred northeastward across the Lakes where rain fell on 1st and then very slowly east towards the Maritime Provinces, rain and snow falling in Quebec Province during the 2nd. At 8 p.m. of the 2nd the centre was in Vermont and during that night a moderate southeasterly gale blew in the Bay of Fundy. The high pressure moved out of the Northwest Territories on the 2nd, there giving place to a depression with milder weather, and on the 3rd brought decidedly colder weather in Ontario, but at the same time with diminishing energy drew southward, while the low pressure over the Maritime Provinces hovered, giving showery weather in Quebec and the Maritime Provinces. On the 4th a re-development of the depression occurred and the centre passed northeastward across the Bay of Fundy giving a heavy general rain in Nova Scotia and New Brunswick.

On the 5th a cyclonic development was in progress, both over the Lake Region and the Lower Mississippi Valley, while an important anticyclonic development was shown over the Northwest Territories. During the following day the cyclonic area with increasing energy moved to the middle Atlantic Coast and then northeastward while anticyclonic conditions were transferred very rapidly to the Southern States; a light fall of snow occurred in Ontario, a heavier fall with a northeast gale along the St. Lawrence and a heavy fall of sleet and rain with an east to south gale in the Maritime Provinces. On the morning of the 7th the conditions were cyclonic from the Gulf of St. Lawrence to Manitoba with the lowest pressure in Quebec, and a cyclonic movement was becoming marked in the Northwest Territories; the weather was moderately cold in Ontario and along the St. Lawrence and comparatively mild in the Maritime Provinces. During the next few days the depression gradually filled in, the anticyclonic conditions gradually spread to the southward of the Lakes bringing a continuance of cold weather in Ontario and Quebec with numerous local snow falls in the Lake Region while in the Maritime Provinces the weather was for the most part fair and continued mild. On the 10th the anticyclone covered Canada from the Pacific to the Gulf of St. Lawrence with decidedly cold weather in the Northwest Territories, temperature below average in Ontario, about average in Quebec and much above in the Maritime Provinces. On the 11th a shallow trough of low pressure formed between the Lakes and the Gulf of Mexico, and at night there was some light snow or sleet in Ontario.

On the 12th a recovery of pressure occurred over the Lake Region, but on the 13th this was succeeded by another decrease as the main portion of the area of depression passed northeastward to New England and the Gulf of St. Lawrence; snow fell throughout Ontario during the night of the 13th and for three days the weather was dull and rainy in the Maritime Provinces. The cold

which set in over Manitoba and the Northwest Territories on the 7th gradually became more intense, the temperature from the 12th to 15th ranging from 30° to 50° below zero, except in southern Alberta where it was not quite so extreme. As the depression mentioned above passed away over the Gulf of St. Lawrence, the anticyclonic conditions extended to the Lake Region and east bringing a decided and general fall of temperature.

A very small depression which first appeared in British Columbia on the 15th moved quickly across the Northwest States and thence north of the Lake Region; a brief decrease in pressure over our Canadian Northwest Territories was followed by an important anticyclonic development accompanied by intensely cold weather lasting for some days; early on the 17th at Battleford the temperature was 40 below zero, Qu'Appelle 40 below zero and Winnipeg 34 below and on the 18th Battleford 44 below, Prince Albert 44 below, Qu'Appelle 44 below, Winnipeg 44 below.

During the 18th and the 19th pressure changes were rapid and important; on the morning of the former day anticyclonic conditions prevailed west and north of the Lake Region with intensely cold weather and an anticyclone with comparatively high temperature covered the Atlantic States and Eastern Canada, while between the two areas was a developing trough of lower pressure extending from the St. Lawrence Valley to the Gulf of Mexico. A general eastward transference of this trough occurred, and there was a rapid movement of a low area within it from the Middle States to the Gulf of St. Lawrence, which caused a snow storm in Ontario and Quebec during the 18th and rain that night in the Maritime Provinces, turning to snow next morning. The anticyclone moved out of the Northwest Territories during the 18th, there giving place to lower pressure while in many parts of Ontario and Quebec on the night of the 19th, it brought the lowest temperature of the month, and in the Maritime Provinces moderately cold weather had set in by the morning of the 20th.

For the next four or five days the weather continued comparatively mild in Manitoba and the Northwest; there was a gradually increasing temperature in the Lake Region while in the Maritime Provinces, with the exception of a temporary break on the 23rd when there was a fall of rain, the weather was colder than before during the month.

A slowly developing depression was on the night of the 24th central in Northern Ontario, the weather was mild in the Northwest Territories and in Ontario, and cold in Quebec and the Maritime Provinces. Next day the depression moved slowly southeastward with increasing energy while a rapid anticyclonic development occurred to the northwest of the Lake Region; that evening a heavy northerly gale blew in the Lake Region and along the St. Lawrence, bringing a decided and rapid fall in temperature, while there was snow and rain with moderate gales in the Maritime Provinces. The high pressure passed quickly southward and caused decidedly cold weather in Ontario and Quebec during the 26th and 27th, and moderate cold with high northwesterly winds in the Maritime Provinces during the 27th and 28th.

After this, comparatively mild weather prevailed in the Lake Region until the end of the month, but an area of high pressure which on the 29th welled down over the Gulf and Maritime Provinces, there brought a continuance of cold weather which was followed on the 31st by a north-east gale with snow and sleet, caused by an area of depression which had passed southward across the Lakes on the 29th, thence to the Middle Atlantic coast and northeastward towards Nova Scotia.

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years except in parts of the Manitoba and Ontario.

The highest and lowest Temperatures in each Province during January were:

British Columbia, $55^{\circ}0$ on 25th, at Esquimalt; $-23^{\circ}0$ on 9th, at Barkerville.

N.-W. Territories, $60^{\circ}0$ on 30th, at Glen Adelaide; $-54^{\circ}0$ on 18th, at Regina.

Manitoba, $47^{\circ}0$ on 30th, at St. Albans; $-52^{\circ}0$ on 15th, at Oak Bank.

Ontario, $65^{\circ}0$ on 1st, at Zurich; $-50^{\circ}3$ on 19th, at White River.

Quebec, $47^{\circ}0$ on 2nd, at Brome; $-32^{\circ}0$ on 20th, at Brome.

New Brunswick, $56^{\circ}0$ on 14th, at Point Lepreaux; $-18^{\circ}5$ on 24th, at Dalhousie.

Nova Scotia, $59^{\circ}7$ on 7th, at Truro; $-4^{\circ}5$ on 24th, at Truro.

P.E. Island, $52^{\circ}0$ on 7th, at Georgetown; $-6^{\circ}7$ on 25th at Kilmahumaig.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JANUARY, 1892.

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PRESSURE, TEMPERATURE, WIND AND PRECIPITATION, &c.—Continued.

PRESSURE IN INCHES.				TEMPERATURE OF AIR.				DIRECTION OF WIND FROM												VELOCITY OF WIND.			PRECIPITATION.													
Mean actual.	Mean reduced.	Highest.	Lowest.	Range.	Mean.	Diff. from aver- age.	Years observ- ed.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Greatest daily range.	Mean temperature of dewpoint.	Mean relative humi- dity.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.W.	W.	N.W.	C.	Total number of hours.	Mean, miles per hour.	Highest days velocity.	Date and direc- tion.	Amount.	Diff. from aver- age.	No. of days.	No. of Auroras.	No. of Foggy.	No. of Thunderstorms.	
in.	in.	in.	in.	in.	°	°		°		°		°	°	°	%															in.	in.					
ONTARIO.—Continued.																																				
Axe Lake.....					9.7	-	1.6	6.40	2	-29.0	20	19.4 47.6																		2.94	-0.60	9.22	1	0	0	
Coldwater.....					14.8	+ 1.6	6.44	2	-25.2	19	20.2 41.6																			2.05	-2.41	16.15	1	0	0	
Beatrice.....					13.7	+ 0.8	15.41	2	18.0	20	18.9 36.5																			3.03	-0.24	15.16	1	0	0	
*North Bruce.....					15.6	+ 0.8	21.41	2	-30.0	20	20.0 46.8																			2.72	-0.50	15.15	2	0	0	
*Guelph.....					20.6	+ 3.6	3.47	8	-3.0	5																				2.44	-0.31	21.10	0	0	0	
Rochelle.....					7.5	-	1.7	15.36	31	-10.0	20	23.3 40.0																		2.59	-0.23	17.14	0	0	0	
Zurich.....					18.9	-	1.7	10.65	6	14.0	20	17.7 47.0																		1.68	-2.34	14.17	1	0	0	
*Point Clark.....					23.4	-	1.6	19.45	6	4.0	19																			2.89	-0.59	18.13	0	0	0	
St. Mary's.....					18.4	-	8.1	3.47	6	-24.0	20	18.1 38.1																		1.80	-1.80	10.21	0	0	0	
Paris.....					17.6	-	8.7	2.49	5	-28.0	20	22.7 46.0																		1.82	-1.21	9.22	0	0	0	
Lucknow.....					19.2	-	3.2	5.49	2	-7.0	19	16.0 33.7																		3.46	-1.43	22.9	1	0	0	
Bognor.....					19.5	-	1.6	1.47	6	-4.0	5																			5.43	-0.15	24.7	2	0	0	
Birnam.....					17.7	-	0.1	9.49	1	-21.3	20	15.2 36.0																		4.23	-1.06	16.15	0	0	2	
*Cottam.....					21.8	-	8.2	3.50	0	-12.0	20																			2.29	-0.07	16.15	0	0	0	
Point Pelee.....					25.3	-	6.5	14.53	6	-11.0	19	8.9 25.0																		1.90	-0.70	7.24	1	0	0	
Kingsville.....					20.0	-	8.7	1.42	0	-7.3	20	12.9 27.0																		2.01	-0.58	13.18	2	0	0	
Chatham.....																																				
Ridgeway.....																																				
Woodstock.....					19.2	-	2.0	18.49	8	-28.0	20	21.3 40.0	19.0 89																	2.49	+0.38	13.18	0	0	0	
London.....					19.9	-	1.0	8.49	0	-26.2	20	17.3 40.2	18.6 85																	3.21	-1.11	18.13	0	0	0	
Port Stanley.....					19.4	-	2.0	18.44	3	-25.8	20	17.2 42.6																		3.72	-0.84	23.8	1	0	0	
Brantford.....					15.9	-	2.7	8.39	31	-27.0	20	22.8 43.0																								
*St. George.....					19.1	-	1.6	7.50	0	-16.0	20	16.0 37.2																		1.88	-1.17	11.20	0	0	0	
Port Dover.....					19.5	-	3.6	18.46	9	-21.2	20																			3.61	-0.63	18.13	0	0	0	
Guelph.....					15.1	-	1.1	9.43	1	-20.0	20																			2.75	-0.04	10.21	0	0	1	
Flora.....					15.5	-	0.7	9.43	0	-13.0	20	18.6 30.0																		2.19	-0.52	8.23	1	0	0	
Gait.....																																				
Niagara Falls, S.....					12.9	-	1.1	6.47	0	-4.0	26																									
Sault Ste. Marie.....					21.5	-	3.3	2.42	9	-25.8	16	20.8 47.2																								
*DeCewsville.....					20.4	-	7.7	2.40	6	-24.0	0																									
Sombra.....					18.9	-	5.1	4.51	0	-19.0	20	15.4 37.9																								
Mattawa.....					3.5	-	4.8	1.34	5	-33.0	13	23.4 54.4																								
Conestogo.....																																				
Stoney Creek.....					23.2	+ 2.6	8.54	0	-19.0	20	15.8 39.0																									
Georgina.....					17.7	-	4.5	3.58	3	-28.2	19	26.9 54.7																								
*Sharon.....					17.1	-	1.8	4.43	6	-19.2	20																									
Toronto.....					29.6	+ 2.6	5.1	46.7	1	-10.2	20	16.3 38.6	18.4 83																							
Altou.....					15.7	-	3.9	1.45	0	-2.4	3																									
Lindsay.....					15.3	+ 1.5	11.41	7	-26.0	20	20.8 38.1																									
Norwood.....					11.3	-	5.8	11.40	0	-34.0	20	22.1 48.0																								
Oshawa.....																																				
Descoronto.....																																				
Kinston.....					17.8	+ 0.2	18.41	5	-22.0	20	17.4 39.9																									
Ottawa.....					12.0	+ 1.5	16.37	2	-24.2	20	18.0 35.6	12.3 89																								
Lakelfield.....					13.6	+ 2.4	6.42	5	-24.5	20	20.2 47.0																									
Alexandria.....					13.3	-	3.6	3.39	6	-29.5	20	17.7 38.3																								
Renfrew.....					10.9	-	0.9	5.39	0	-30.4	20	17.6 35.0																								
Peterborough.....					17.5	-		44.0	2	-34.0	20	14.2 32.0																								
Bancroft.....					12.2	+ 2.4	6.41	0	-31.8	20	22.7 45.2																									
Haliburton.....					11.9	-	6.5	3.42	0	-31.0	20	18.8 39.0																								
Clontarf.....					12.7	-	2.2	4.41	5	-29.8	20	22.9 43.2																								

STATIONS RECEIVED TOO LATE FOR DECEMBER, 1891.

PROVINCE.	STATION.	MEAN	HIGHEST	LOWEST		PRECIPITATION.		AURORAS.
		TEMP.	TEMP. DATE.	TEMP.	DATE.	Amount.	Days.	
		°	°	°		in.		
N. W. Territory.	Regina	8.8	38.0	17	-43.0	25	0.53	7
	Chaplin	17.8	45.0	18	-27.0	31	0.30	2
Manitoba	Elkhorn	10.5	38.5	1	-33.0	25	0.72	8
	Channel Island	8.4	35.0	12	-29.0	30	0.42	5
Quebec	Point des Monts	25.1	36.0	23	-6.0	28	6.19	6
	Cape Chatte	27.4	46.0	5	10.0	29		8

SNOWFALL AT SNOWSHOE CREEK, CANADIAN, B. C.

WINTER.	SEPTEMBER.	OCTOBER.	NOVEMBER.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	APRIL.	MAY.	TOTAL.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1880-90	4.5	0.5	25.5	52.0	25.0	33.0	51.5	11.5	....	236.5
1890-91	....	15.5	28.0	44.0	32.5	36.0	52.5	8.0	1.5	218.0
1891-92	6.0	2.5	19.0	84.5	63.5	21.0	....	....	....	....

PRECIPITATION.

The rainfall, except in some of the districts of Ontario, has in general exceeded the average, especially in the Maritime Provinces.

The general distribution is as follows:—

In BRITISH COLUMBIA the rainfall was on the coast 5.08 in., in the interior little has fallen.

In the NORTH-WEST TERRITORIES it was inappreciable, or 0.00 in. below the fall in 1891.

In MANITOBA no rain is recorded except a few drops at one or two stations.

In ONTARIO, West and South-West District it was 0.38 in., or 1.18 in. below the average. In the North and North-West District it was 0.79 in., or 0.07 in. above the average. In the Central District it was 0.19 in., or 0.06 in. below the average; and in the East and North-East District it was 0.40 in., or 0.40 in. below the average.

In QUEBEC it was 0.68 in., or 0.15 in. above the average.

In NEW BRUNSWICK it was 4.22 in., or 2.48 in. above the average.

In NOVA SCOTIA it was 5.25 in., or 2.81 in. above the average.

In PRINCE EDWARD ISLAND it was 3.71 in., or 2.29 in. above the average.

Rainfall 5 in. and upwards during month:—

B. COLUMBIA.—Quamichan 5.08 in.; Agassiz, 6.87 in.; Port Moody, 7.85 in. NOVA SCOTIA.—Digby, 5.00 in.; Port Hastings, 5.81 in.; Truro, 5.33 in.; Yarmouth, 6.66 in.; Halifax, 5.29 in. NEW BRUNSWICK.—Point Lepreaux, 5.74 in.; St. John, 7.66 in.; Fredericton, 5.55 in.; Grand Manan, 6.47 in. NEWFOUNDLAND.—St. Johns, 6.83 in.; Channel, 6.42 in.

Rainfall 1 inch and upwards in 24 hours:—

1st, Ennismore, 1.00 in.; Lyons, 1.03 in.; Cartier, 1.30 in.; Wiarton, 1.25 in.; Port Moody, 1.00 in.; St. John, Nfld., 1.66 in.

2nd, St. Hyacinthe, 1.00 in.; Thompson, 1.22 in.; North Bruce, 1.05 in.; Alexandria, 1.55 in.; Guelph, 1.40 in.; Sprucedale, 1.15 in.

3rd, St. John, 2.22 in.; Yarmouth, 1.66 in.; Grand Manan, 1.10 in.; St. Andrews, 1.28 in.

4th, Digby, 2.00 in.; Point Lepreaux, 2.86 in.; St. John, 1.78 in.; Fredericton, 2.25 in.; Chatham, 2.02 in.; Yarmouth, 1.19 in.; Grand Manan, 1.07 in.; Bathurst, 1.90 in.

5th, Channel, 1.32 in.

7th, Channel, 1.10 in.; Pictou, 1.00 in.; Port Hastings, 2.60 in.; Truro, 1.84 in.; Bathurst, 1.30 in.; Sydney, 2.18 in.; Halifax, 1.29 in.

8th, Channel, 2'07 in.; Whitehead, 1'20 in.; Port Dover, 1'19 in.
 13th, Digby, 1'50 in.
 14th, Dochester, 1'11 in.
 15th, Point Lepreaux, 1'25.; Port Moody, 1'10 in.
 19th, Pictou, 1'00 in.; Dorchester, 1'25 in.; St. John, 1'02 in.; Grand Manan, 1'21 in.; Charlottetown, 1'15.; in Fredericton, 1'20 in.
 20th, St. John, Nfld., 1'05 in.
 21st, Port Moody, 1'00 in.
 22nd, Georgina, 1'08 in.
 24th, St. John, N.F.L., 1'42 in.
 28th, Abbotsford, 1'92 in.; French Creek, 1'27 in.
 29th, Agassiz, 3'10 in.; Quamichan, 2'20 in.; Port Moody, 2'80 in.; Esquimalt, 1'77 in.

SNOWFALL.

In Ontario the snowfall has in general exceeded the average, except to the north of Lakes Huron and Superior, where only a trifling quantity has fallen. In the other provinces less than the average has fallen.

The distribution is as follows :—

BRITISH COLUMBIA—On the coast only a small quantity has fallen, but in the interior upwards of five feet is recorded.

In N. W. TERRITORIES about 3 in. has fallen, or about 1 in. below that of 1891.

In MANITOBA 5'1 in. has fallen, or about three times the average, but considerably less than half of that of 1891.

In the districts of ONTARIO the amount is 21'7 in., or 5'0 in. above the average; 23'2 in., or 2'4 in. below the average; 21'7 in., or 6'3 in. above the average; 20'0 in., or 0'0 in. above the average.

In QUEBEC 26'5 in., or 0'6 in. below the average.

In NEW BRUNSWICK 18'4 in., or 5'8 in. below the average.

In NOVA SCOTIA 13'1 in., or 5'7 in. below the average.

In P. E. ISLAND 17'9 in., or 9'3 in. below the average.

Snowfall 15 in. and upwards during month :

BRITISH COLUMBIA—Barkerville, 62 in.; Snow Shoe Creek, 64 in.; Griffin Lake, 40 in.

ONTARIO—Olivers Ferry, 19 in.; Port Hope, 17 in.; Georgetown, 64 in.; Orillia, 23 in.; Huntsville, 29 in.; Burks' Falls, 24 in.; Mount Forest, 25 in.; Cayuga, 36 in.; Nelson, 23 in.; Denbigh, 19 in.; Princeton, 23 in.; Scarborough, 16 in.; Orangeville, 20 in.; Blenheim, 22 in.; Warton, 53 in.; Glastonbury, 15 in.; Cowal, 22 in.; Sunshine, 18 in.; Goderich, 16 in.; Petrolia, 17 in.; Alexandria, 28 in.; London, 28 in.; Durham, 20 in.; Lindsay, 25 in.; Coldstream, 31.; Ottawa, 21 in.; Coldwater, 26 in.; Woodstock, 22 in.; Port Dover, 31 in.; Rockliffe, 22 in.; Port Stanley, 33 in.; Saugeen, 36 in.; Parry Sound, 66 in.; Kingston, 27 in.; Novar, 28 in.; Sprucedale, 18 in.; Shannonville, 34 in.; St. Thomas, 35 in.; Barrie, 25 in.; Midland, 15 in.; Fergus, 25 in.; Cartier, 17 in.; Thedford, 29 in.; Joly, 43 in.; Lyons, 22 in.; Upland, 19 in.; Whiteside, 22 in.; Birnam, 39 in.; Kingsville, 17 in.; St. Mary's, 17 in.; Lucknow, 31 in.; Zurich, 16 in.; Mattawa, 22 in.; Sault St. Marie, 16 in.; Stoney Creek, 20 in.; Gravenhurst, 19 in.; Elora, 24 in.; Alton, 16 in.; Point Clark, 18 in.; Sharon, 16 in.; St. George, 17 in.; Cottam, 21 in.; Paris, 15 in.; DeCewsville, 62 in.; Bognor, 51 in.; Axe Lake, 29 in.; Peterborough, 23 in.; Haliburton, 21 in.; Niagara Falls, S., 36 in.; Norwood, 26 in.; Presque Isle, 38 in.

QUEBEC—St. Hyacinthe, 34 in.; Brome, 28 in.; Quebec, 28 in.; Father Point, 23 in.; Point des Monts, 40 in.; Montreal, 40 in.; Cape Magdalen, 24 in.

NEW BRUNSWICK—Bathurst, 22 in.; Fredericton, 28 in.; Chatham, 19 in.; St. Andrews, 33 in.; Dorchester, 20 in.; Dalhousie, 28 in.

NOVA SCOTIA—Digby, 15 in.; Pictou, 30 in.; Truro, 15 in.; Yarmouth, 24 in.; St. John, 17 in.

P. E. ISLAND—Georgetown, 19 in.; Kilmahumag, 17 in.

Snowfall 5 in. and upwards in 24 hours.

2nd, Barkerville, 5 in.; De Cewsville, 8 in.

3rd, Birnam, 12 in.; 5 Bognor, in.; Thedford, 7 in.; Coldstream, 5 in.; St. Thomas, 6 in.; London, 11 in.

4th, Griffin's Lake, 5 in.; Coldstream, 8 in.; Pelee Island, 6 in.; Port Stanley, 5 in.

- 6th, Belleville, 6 in.; Nelson, 7 in.; Cowal, 6 in.; Thedford (on 6th and 7th) 12 in.; Stoney Creek, 6 in.; Ottawa, 7 in.; Alexandria, 9 in.
- 7th, Renfrew, 5 in.; Cayuga, 12 in.; De Cewsville, 18 in.; Bognor, 6 in.; Coldstream, 6 in.; Owen Sound, 7 in.; Niagara Falls, S., 6 in.; Norwood, 5 in.; Presqu' Isle, 8 in.
- 8th, Cayuga, 7 in.; Wiarton, 10 in.; Griffin's Lake, 7 in.; Shannonville, 6 in.; Axe Lake, 6 in.; Niagara Falls, S., 10 in.; Port Dover, 12 in.; Parry Sound, 10 in.; Kingston, 6 in.; Sprucedale, 6 in.
- 9th, Wiarton, 12 in.; De Cewsville 6 in.; Axe Lake 6 in.; Fredericton 5'0 in.; Parry Sound, 11 in.
- 10th, Petrolia, 6 in.; Parry Sound, 11 in.
- 11th, Ennismore, 5 in.; Beatrice, 5 in.
- 12th, Joly, 7 in.; Mattawa, 6 in.; Huntsville, 7 in.; Axe Lake, 6 in.; Point Clark, 6 in.; Novar, 6 in.
- 13th, Barkerville, 5 in.; Griffin's Lake, 6 in.; St. Thomas, 5 in.; Peterborough, 6 in.; Point Escuminac, 5 in.; Stoney Creek, 5 in.; Bancroft, 5 in.; Ottawa, 5 in.; Richmond, 6 in.
- 14th, Paris, 5 in.; Birnam, 5 in.; Barkerville, 7 in.; Cayuga, 7 in.; Nelson, 6 in.; Princeton, 7 in.; Orangeville, 8 in.; De Cewsville, 8 in.; Port Hope, 6 in.; Collingwood, 5 in.; Elora, 6 in.; Guelph, 7 in.; Port Stanley, 5 in.
- 15th, Barkerville, 6 in.; Wiarton, 6 in.; Midland, 6 in.
- 16th, Fergus, 6 in.; Presqu' Isle, 6 in.
- 17th, Griffin's Lake, 7 in.
- 18th, Kingsville, 7 in.; Barkerville, 10 in.; Nelson, 7 in.; Princeton, 6 in.; Blenheim, 7 in.; De Cews ville, 7 in.; Shannonville, 12 in.; Lyons, 6 in.; St. Thomas, 6 in.; Dalhousie, 10 in.; Point Escuminac, 6 in.; Stoney Creek, 5 in.; Brome, 12 in.; Ottawa, 5 in.
- 19th, Paris, 5 in.; Cottam, 6 in.; Fergus, 6 in.; Niagara Falls, S., 9 in.; Norwood, 6 in.; Picton, 5 in.; St. Hyacinthe, 8 in.; Bancroft, 12 in.; Bathurst, 12 in.; Richmond, 9 in.
- 20th, Huntsville, 5 in.; Cape Magdalene, 5 in.; Petrolia, 5 in.
- 21st, Griffin's Lake, 5 in.; Bognor, 6 in.; Huntsville, 5 in.; Owen Sound, 10 in.; Collingwood, 7 in.; Posen, 5 in.; St. John, N.F.L., 5 in.
- 22nd, Wiarton, 6 in.; Griffin's Lake, 7 in.; Axe Lake, 5 in.
- 23rd, Norwood, 5 in.
- 24th, Thompson, 5 in.
- 26th, Birnam, 7 in.; St. Andrew, 7 in.
- 27th, Cape Magdalene, 5 in.; Pictou, 8 in.; St. John, 6 in.; Fredericton, 5'0 in.; Charlottetown, 5 in.; St. Andrew, 11 in.
- 28th, Fort Francis, 10 in.
- 30th, Barkerville, 5 in.; Pictou, 7 in.
- 31st, Dorchester, 6 in.; Pictou, 5 in.; Yarmouth, 5 in.; Charlottetown, 6 in.

Aurora recorded on—

Where the class of aurora is noted by the observer it is given (I), being the brightest (IV), the feeblest in brilliancy.

- 1st, Elkhorn, Minnedosa, IV; Oonikup.
- 3rd, Stoney Creek, III; Deseronto, IV.
- 4th, Channel Island, IV; Gravenhurst, IV; Egremont, IV; Pelee Island, I; Bognor, I; Russell, III; Alexandria, IV; Prince Albert, IV; Deseronto, I.
- 5th, Bancroft, I; Posen, I; Gravenhurst, II; Egremont, I; Beatrice, I; Cotham, I; Russell, II; Point Lepreaux, Uplands, I; Peterborough, I; Axe Lake, I; Clontarf, II; Dorchester, I; Henrietta, I; Hillview, I; Huntsville, Bognor, I; Sharon, I; Belleville, I; Burks' Falls, II; Kingsville, II; Sombra, Zurich, Renfrew, I; Georgina, Gladstone, Joly, Savanne, Pembina Crossing, III; St. Albans, I; Ottawa, IV; Alexandria, I; Lindsay, III; Little Forks, I; Durham, III; Bathurst, Coldwater, II; Sidney, II; St. John, II; Prince Albert, IV; Kingston, III; Minnedosa, III; Novar, II; Deseronto, I; Oonikup.
- 6th, Channel Island, III; Glen Adelaide, Mattawa, Buda, Port Arthur, I; Minnedosa, I.
- 7th, Chicoutimi.
- 9th, Brandon, IV.
- 10th, Little Forks, II.
- 14th, Kingston, IV.
- 16th, Posen, IV; Pembina Crossing, II; Kingston, IV.
- 17th, Posen, II.
- 18th, St. Albans, IV.
- 19th, Posen, IV; St. Albans, IV; Kingston, IV.
- 20th, Channel Island, IV; Elkhorn.
- 21st, St. Albans, IV.
- 22nd, St. Albans, III; Russell, III; Oonikup.
- 23rd, Channel Island, III; Portage la Prairie, Pembina Crossing, II; Oonikup.
- 24th, Channel Island, IV; Portage la Prairie, Minnedosa, III.

- 25th, Posen, I ; Elora, Portage la Prairie, Pembina Crossing, III ; Prince Albert, III ; Minnedosa, IV ; Medicine Hat, IV.
 26th, Portage la Prairie, Prince Albert, IV ; Minnedosa, IV.
 27th, Portage la Prairie, Pembina Crossing, III ; Little Forks, II.
 28th, Hillview, Portage la Prairie, St. Albans, IV ; Medicine Hat, IV.
 29th, Medicine Hat, IV ; Toronto, I ; Bancroft, IV ; Egremont, II ; Uplands, Thedford, Kingsville, III ; Sombra, Portage la Prairie, Savanne, Pembina Crossing, III ; St. Albans, III ; Russell, III ; Little Forks, III ; Prince Albert, III.
 30th, Medicine Hat, IV ; Father Point, II ; Oonikup, Bancroft, IV ; Channel Island, IV ; Cotham, III ; Hillview, Elkhorn, Gladstone, Portage la Prairie, Joly, Savanne, Pembina Crossing, II ; Russell, III ; Prince Albert, III ; Posen, II.
 31st, Oakbank, I ; Channel Island, IV ; Cotham, IV ; Hillview, Elkhorn, IV ; Savanne, Pembina Crossing, IV ; Russell, IV ; Durham, I ; Prince Albert, III ; Medicine Hat, IV ; Oonikup.

Remarks by some of the Observers on the Auroras during month.

5th, BELLEVILLE.—Brilliant. COTHAM, N. W. T.—Magnificent display in addition to arches, streamers, corona and waves, there was a grand spiral valance stretching from the eastern end to beyond the zenith. It was fringed with a light now purple, now rose and moved westward and eastward with a stately sweep. The motion gave one the idea of sound, but I could detect none. DORCHESTER, N. B.—Very brilliant. NORWOOD, ONT.—A light of a pale yellow colour in E. at 9 p.m. GRAVENHURST, ONT.—Bright over two thirds of the sky. MATTAWA, ONT.—Aurora continued all night. SAVANNE, ONT.—Very bright. ST. ALBANS, MAN.—Visible soon after sunset. BEATRICE, ONT.—The auroral display commenced at 6 p.m. and had not entirely disappeared at 10 p.m., being at times very beautifully coloured and brilliant. BANCROFT, ONT.—7 to 10 p.m., auroral arch gradually spreading from the north to S. of zenith ; imperfect corona. Flashes of dark rose colour in the N.E., unusually fine display. OONIKUP, N. W. T.—It was especially grand spreading over nearly the whole sky, beautifully tinted with green and crimson.

29th, TORONTO, ONT.—5 a.m., bright auroral display, streamers waves and pulsations strongly coloured with red and yellow, movement rapid from N. to N.E. At 6 a.m. eastern standard time, aurora still visible and only seemed to disappear from the advancing sunlight.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF JANUARY, 1892.

HOURS ENDING																	
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.	
ESQUIMALT.....				0 00	0 03	0 25	0 33	0 36	0 38	0 28	0 17	0 06	0 00				
AGASSIZ, B.C.....				00	00	03	20	35	35	20	25	18	00				
BRANDON.....				00	28	58	72	72	67	68	50	30	00				
INDIAN HEAD.....				02	14	34	45	51	52	43	33	13	00				
WINNIPEG.....				04	30	65	67	68	60	60	65	20	00				
KINGSVILLE.....				05	25	40	40	45	45	45	44	37	07				
WOODSTOCK.....				04	14	35	44	43	41	30	31	19	01				
TORONTO.....				06	28	36	39	44	34	30	30	21	04				
LINDSAY.....				04	16	15	20	28	30	31	37	25	18	8			
BARRIE.....				01	12	10	26	28	26	34	26	24	8				
KINGSTON.....				06	18	19	25	28	34	31	22	15	00				
.....																	
MONTREAL.....				00	04	12	20	19	25	24	23	07	00				
FREDERICTON.....				8	19	19	43	43	43	45	33	20	02				
SYDNEY.....					08	19	22	23	20	21	21	16	01				
				ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	KINGSVILLE.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)	0 22	0 20	0 49	0 31	0 52	0 37	0 28	0 31	0 24	0 22	0 21	0 17	0 30	0 71			
MAXIMUM DAILY AMOUNT.....	0 80	0 71	0 82	0 83	0 84	0 87	0 82	0 81	0 90	0 79	0 90	0 93	0 88	0 81			
DATE.....	23	6	30	25	1	27	15	15	26	15	5	10	10	8			
NO. OF DAYS COMPLETELY CLOUDED.....	13	13	1	11	4	9	13	10	15	12	12	19	12	13			

PROBABILITIES.

The probabilities issued by this office at 11 p. m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a. m.

The number of predictions issued during the month was 606. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage Fully.
MANITOBA	98	72	13	13	80 1
LOWER LAKE REGION	116	86	24	6	84 5
UPPER ST. LAWRENCE	107	60	30	8	78 5
LOWER ST. LAWRENCE	96	66	20	10	79 1
GULF	80	52	25	12	72 5
MARITIME PROVINCES	100	60	24	16	72 0
TOTAL	606	405	136	65	73 1

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions the reports from the agents at the "Probability Stations," as well as the telegraphic reports, are used.

The daily probabilities and the storms warnings were issued by Probability Officer R F Stupart.

STORM WARNINGS.

During the month warnings on the approach of six storms were issued to our agents, and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 406, of which 91, or 85·8 per cent., were verified. At 23 stations the force did not reach that indicated by the signals displayed; 4 warnings were received late owing to delay in telegraphic transmission, and 8 were issued late.

In conjunction with the warnings, predictions as to the probable directions of the wind were given, and of the 91 warnings verified as to force, 56, or 61·5 per cent., were fully verified as to direction, and 62, or 68·3 per cent., were fully and partially verified.

No. 1. At 10.10 p.m. on the 1st, Gulf and Ocean stations were warned for a heavy E. through S. to S.W. gale in advance of a deep disturbance central over Lake Michigan. Subsequently during the evening and night of the 3rd a heavy gale prevailed in the Bay of Fundy and its vicinity, and in Cape Breton a moderate gale was felt together with a heavy easterly roll on the coast. Signals were lowered at 10.40 p.m. on the 3rd.

No. 2. Ocean Stations were warned for a heavy easterly gale on the morning of the 6th, a disturbance of importance being over the Middle Atlantic coast. Afterwards as it passed over the Maritime Provinces during the night of the 6th, and early morning of the 7th, its accompanying heavy easterly gales were experienced throughout the districts warned. Signals were lowered on the morning of the 7th.

No. 3. Gulf and Ocean stations were warned for a heavy easterly gale at 11.35 a.m. on the 13th, in advance of a shallow depression then covering Tennessee. The depression subsequently travelled northeasterly to the Gulf of St. Lawrence, and in its advance gave a gale in the Bay of Fundy and its neighbourhood chiefly from the southwest, and also a southwest gale at Louisburg, C.B. Signals were lowered at 11 a.m. on the 16th.

No. 4. At 10.25 p.m. on the 18th, Gulf and Ocean stations were warned for a heavy easterly gale, owing to an approaching and developing depression from the Southern States. On the 19th St. John recorded 30 miles an hour, Low Point 35 miles, and most of the other places notified reported a fresh to heavy gale, which as a rule veered from the southeast to the southwest. Signals were lowered at 11 a.m. on the 20th.

No. 5. Gulf and Ocean stations were warned at 9.45 p.m. on the 25th, for a heavy gale from the N. through N.W. to W., on the approach of an important high pressure area from the Northwest, taken in conjunction with an existing disturbance then in Eastern Canada. Afterwards on the 27th, Pictou reported S.W. to N.W. 44 miles an hour, Low Point 35 miles an hour, Sydney a strong southwest gale and Canso a moderate storm. Signals were lowered at 4 p.m. on the 27th.

No. 6. At ¹⁰**OROLOG** the 30th, Scotia and Fundy were warned for a heavy easterly gale in advance of a disturbance passing up the Atlantic some distance off the American coast. The same night at 10 the warning was further extended to Cape Breton stations. During the 31st, chiefly early in the morning, a heavy easterly to northerly gale was experienced over the districts warned. Signals were lowered at noon on February 1st.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR JANUARY, 1892.

There was nothing of importance recorded until the afternoon of the 4th, when a small disturbance appeared. After 2 a.m. the next day the declination magnet took up a quick westerly swing after which it gradually returned to its normal reading: attending this westerly movement was a marked decrease of the vertical component. The magnets continued slightly disturbed until the evening when the movements increased: and during this night there was registered the most important storm we have had for a long period. The disturbing power was particularly active between 8 and 10.20 p.m. At 9.30 the declination magnet was on a rapid easterly swing of $50'$. After reaching its minimum it oscillated for a few minutes and then took a westerly excursion of $1^{\circ} 10'$ in a short time, vibrations then followed when a still further westerly swing took place.

A prominent feature of this disturbance, was that in some of the swings the magnet would pause for a short time and then move rapidly. In one case there were no less than twelve of these rests in a swing of about four minutes duration. The greatest easterly reading took place at 9.33 and the westerly extreme at 10.12 p.m., the total range being $1^{\circ} 50'$. After 10.30 p.m. the magnets became considerably steadier. The h. f. during the earlier portion of the disturbance was considerably increased, the magnet moving in long swings, its maximum value was reached at 8.40 p.m. and the minimum about 10 p.m. Previous to the minimum being reached the magnet vibrated a good deal. The total change of h. f. was $.0075$ C. G. S. The v. f. was sharply increased after 6 p.m. A rapid diminution commenced after 8.20 p.m. and about 10 p.m. there were some rapid changes going on. The maximum took place at 7.23 p.m. and the minimum at 9.48 p.m. A slight disturbance prevailed on the 6th. During the following seven days slight disturbances would occasionally appear. On the night of the 15th, disturbing action was again apparent and on the mornings of the 16th, 17th and 18th the magnets were decidedly disturbed especially the 17th, the movements were undulatory. From the 18th to the 29th there was nothing of importance recorded. On the morning of the 29th a moderate storm began. At 2.50 the declination magnet moved west oscillating at the same time. After 4 a.m. another westerly movement set in of a prolonged character. There were three well marked maximums shewn viz:—at 5.15, 5.40 and 6.03 a.m., after the latter time an easterly sweep brought the magnet to its normal reading and by 7 a.m. the disturbance had passed off. The total range of declination was $51' 2''$. There were no large changes in the force instruments, both components were below their normal values.

From the 29th to the end of the month the only movement that calls for any notice was an easterly sweep of $30'$ at 9.30 p.m. of the 30th, followed by a gradual westerly rise of $34'$. The force magnets shewing but slight change.

Auroral light was observed at 5 a.m. of the 29th (class I) bright auroral streamers, waves and pulsations strongly tinged with red and yellow, movement rapid N. to N.E. On the 3rd, 9th, 14th, 15th, 19th, 20th, 21st, 24th, 25th, 26th, 27th, 28th, night of the 29th and 30th the sky was clear but no aurora was observed: on all other nights, clouds or haze would have hidden any aurora which might have existed. Brilliant auroras were observed throughout the Dominion on the 5th and 29th.

CHARLES CARPMAEL,

Director.

METEOROLOGICAL OFFICE,
TORONTO, March 10th, 1892.

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METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

FEBRUARY, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years from Manitoba to Nova Scotia by amounts varying between .16 in. at the mouth of the St. Lawrence to nearly .07 in. in Manitoba and Nova Scotia.

February was remarkable for the important cyclonic movements over the continent between the 9th and 13th, also for the number and importance of the high pressure areas during the last two weeks of the month.

A shallow depression which was central over Iowa on the morning of the 1st, then traversed the Lake Region and skirted our Atlantic seaboard, its energy becoming greatly increased when to the southward of Nova Scotia. Its effect was a moderately heavy fall of snow and rain between the 1st, and 3rd, in the Lake Region and the Upper St. Lawrence Valley, and on the 4th a light snow-fall over Eastern Canada, except in Cape Breton and its vicinity, where the snowfall was much heavier than elsewhere, and where at the same time the winds increased to a moderate gale from the northward.

In the Northwest Territories and Manitoba, the month opened with comparatively high pressure and fine moderately cold weather; these conditions were maintained for several days with the exception of light local snowfalls on the 2nd.

The Northwest high pressure passed eastward in rear of the depression and being further reinforced by another high pressure area from the Hudson Bay district, fine and decidedly cold weather, for several days, was experienced from the Lakes to the Atlantic; minima recorded —8 on Lake Huron, —4 at Toronto, —24 at Rockliffe, —4 at Montreal, —8 at Quebec and Chatham, 6 at Halifax.

An area of low pressure which had apparently crossed the South Pacific States on the 5th, passed into the Lake Region on the 7th, and afterwards slowly dispersed in the St. Lawrence Valley. It brought for several days very unsettled weather, from the Lakes to the Atlantic with a fairly heavy fall of snow, together with a northeasterly gale in the Lower St. Lawrence Valley. In Ontario however, the snow changed to rain in most places.

The passage on the 5th of a slight depression over the Northwest Territories and Manitoba, attended by a few snowflurries, was followed on the 6th, and two following days by higher pressure and fine decidedly cold weather; minima generally recorded —16 to —34.

The most important cyclonic system of the month now made itself generally felt in Canada. It was first shown on the morning of the 9th, as a deep disturbance central near Edmonton, Alberta. It travelled with rapidity southeastward over the Lower Lake Region to the New England States, where it was reinforced on the 11th, by a subsidiary which had formed subsequently off the Middle Atlantic Coast. It then swept with great force over the Maritime Provinces expending itself to a great extent for a while by noon of the 12th, but at night it was again reinforced by another important storm centre from the southward, and on the morning of the 13th, Sydney, C. B., reported the low barometric reading of 28.48 inches reduced to sea level. The weather of this

period, was snow and high winds from the Rockies to Manitoba, on the 9th ; in the Lake Region and Upper St. Lawrence districts, between the 10th and 12th, and a very heavy gale throughout the Lower St. Lawrence and the Maritime Provinces between the 11th and 13th, accompanied by a heavy fall of snow which turned to rain in most localities.

An area of high pressure, of comparatively feeble energy although attended by very cold weather, travelled the country in rear of the low pressure systems. Its minima were, in the North-west on the 11th, -24 ; in Ontario on the 13th, Parry Sound, -26 ; Toronto, -7 ; Kingston -18 ; also on the 14th, Montreal, -6 and Quebec, -8 .

Another deep depression was situated near Edmonton, Alberta, on the morning of the 12th. It at first travelled more to the southward than its predecessor, and on the morning of the 14th, was centred near St. Louis, Missouri. It then changed its course and the same night was situated with further increased energy over the eastern portion of Lake Erie, its centre being of small diameter. Afterwards it dispersed with unusual rapidity, and by the following night had almost completely disappeared. It gave on the 12th, a fall of snow from the Rockies to Manitoba, and on the 14th, an easterly gale with a moderately heavy snow and sleet storm in Ontario. Snow also occurred generally, during the night of the 14th, and on the 15th, along the St. Lawrence, and snow turning to rain in the Maritime Provinces, when the easterly gale also extended to Quebec and the Bay of Fundy.

On the 13th, an area of high pressure appeared over the Northwest Territories and spread quickly throughout Canada in rear of the last mentioned disturbance. High pressure areas, often of considerable importance, then successively followed one another, and until the end of the month the pressure was as a rule everywhere high. The most important of the series was shown in the far Northwest on the 25th, its centre then passed northward of the Lake Region to the Gulf of St. Lawrence, where on the morning of the 27th, the barometer reduced to sea-level stood at 31.08 inches. The weather throughout this protracted period was for the most part fine, especially in the Lower St. Lawrence, the Gulf, and the Maritime Provinces. The interruptions to the prevailing fine weather, and these were caused on each occasion by the influence of slight depressions, were, in the Northwest Territories and Manitoba, light falls of snow on the 16th, 19th, 26th and 27th; snow and sleet with a slight thaw on the 22nd. In the Lake Region light snowfalls on the 18th and 19th, and snow and sleet on the 25th and 29th. In the St. Lawrence Region, light snow falls on the 20th and 29th, and snow and sleet on the 25th, and in the Maritime Provinces light snow or sleet on the 25th. The winds were frequently very strong, and on the 27th a gale is reported to have occurred on the western shores of Newfoundland attended by great loss of life to fishermen. Temperature was at first below its average in all districts; in the Northwest Territories and Manitoba, minima were recorded from the 14th up to the 19th, of -26 to -51 . In the Lake Region and along the St. Lawrence, temperatures below zero were very general between the 14th and 17th, the minima recorded were, White River, -46 ; Rockliffe, -34 . From the 20th to the 26th, more especially from the Lakes to the Atlantic, it was correspondingly above its average; only a few degrees of frost occurred at night, and the day temperature often exceeded 40° . The last few days of the month were again characterized by colder weather, the minima of the month occurring in the Lower St. Lawrence Valley, when Father Point recorded -22 .

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years at all stations except near the eastern extremity of Lake Ontario. The excess was greatest in Cape Breton Island where it amounted to nearly 7° .

The highest and lowest Temperatures in each Province during February were:

B. COLUMBIA, $61^{\circ}0$ on 24th, at Agassiz ; $10^{\circ}0$ on 6th, at Spences Bridge.

N. W. TERRITORIES, $51^{\circ}9$ on 3rd-24th, at Calgary. $-40^{\circ}4$ on 14th, at Henrietta.

MANITOBA, $29^{\circ}0$ on 23rd, at Gladstone ; $-51^{\circ}0$ on 15th, at Posen.

ONTARIO, $52^{\circ}6$ on 23rd, at Coldwater ; $-46^{\circ}8$ on 16th, at White River.

QUEBEC, $46^{\circ}4$ on 26th, at Chicoutimi ; $-33^{\circ}0$ on 17th, at Lennoxville.

N. BRUNSWICK, $41^{\circ}0$ on 21st, at St. John ; $-16^{\circ}5$ on 28th, at Dalhousie.

NOVA SCOTIA, $46^{\circ}7$ on 26th, at Truro ; $-16^{\circ}7$ on 7th, at Truro.

P. E. ISLAND, $41^{\circ}0$ on 26th, at Georgetown ; $-9^{\circ}4$ on 29th, at Kilmahumraig.

	PRESSURE IN INCHES.			TEMPERATURE OF AIR.						DIRECTION OF WIND FROM						VELOCITY OF WIND.				PRECIPITATION.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Mean actual.	Mean reduced.	Range.	Mean.	Diff. from aver- age.	Years observ- ed.	Highest.	Date.	Lowest.	Date.	Mean relative humi- dity.	Mean amount of cloud.	No. of days completely clouded.	N. E.			S. E.			S. W.			W.			N. W.			C.	Total number of hours.	Mean, miles per hour.	Highest days velocity.	Date and direc- tion.	Amount.	Diff. from aver- age.	No. of fair days.	No. of Auroras.	No. of Fogs.	No. of Thunderstorms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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TEMPERATURE, WIND AND PRECIPITATION, &c.—Continued.

STATION.	PRESSURE IN INCHES.			TEMPERATURE OF AIR.				DIRECTION OF WIND FROM.				VELOCITY OF WIND.			PRECIPITATION.					
	Mean actual.	Highest.	Lowest.	Range.	Mean.	Diff from average.	TEMPERATURE OF AIR.		N. E.	S. E.	S. W.	N. W.	Total number of hours.	Mean miles per hour.	Highest days.	Date and direction.	Amount.	No. of days.	No. of Auroras.	No. of Thunder storms.
							Lowest.	Highest.												
ONTARIO—Continued.																				
Axe Lake.....	16.6	6.5	6.42	0	25	-27	0	6	18.6	47.0							1.91	in.		
Coldwater.....	19.9	6.1	6.52	6	24	-18.5	13	20.3	37.6								2.60	+0.57	12	17
Beatrice.....	18.1	5.0	16.40	0	21	-20.0	13	16.2	29.0								1.72	-2.93	10	19
Gravenhurst.....	19.2	4.1	12.45	0	1	-19.0	13	17.0	8.41	9	7	13	2	3	23	12	2	4	14	25
•North Bruce.....	23.3	0.8	3.45	6	23	-7.0	5	22	5	8	5	8	2	11	20	12	2	9	15	87
•Rockville.....	13.0	1.5	15.46	9	23	-34.0	16	22.8	46.6								1.75	-0.90	13	16
•Zurich.....	25.5	5.3	11.41	0	25	-8.0	16	14.0	30.0								1.56	-0.77	8	21
•Point Clark.....	25.9	3.2	19.40	0	20	-2.0	13										3.53	+1.06	10	19
St. Mary's.....	25.0	0.8	3.41	6	21	-10.0	17	15.2	33.0								2.72	-0.25	6	23
Paris.....	23.4	3.6	2.43	6	18	-10.0	17	18.8	53.0								2.96	-0.23	9	20
•Lucknow.....	24.4	6.0	5.49	6	25	-4.5	17	15.3	28.9								1.67	-0.94	12	17
•Rogor.....	21.5	1.7	1.40	0	22	-13.0	5										2.86	-0.34	16	13
•Brantford.....	24.7	6.2	9.40	3	21	-7.8	16	12.5	31.1								3.80	-0.49	15	14
•Cottam.....	30.1	1.8	3.50	0	24	-2.0	17										3.88	-0.21	13	16
Point Pelee.....	33.7	8.8	14.42	0	28	-8.0	16	6.7	19.0								2.42	-0.64	13	16
Kingsville.....	29.0	1.2	1.46	0	8	-6.0	16	10	22.0								0.42	+0.98	6	23
Chatham.....	26.8	3.9	6.66	0	26	-6.0	13	15.0	38.8								2.93	-0.68	16	13
Ridgetown.....	25.0	4.9	18.43	9	18	-8.0	17	17.3	32.4	24.5	90	1	8	5	25	41	14	9	7	28
Woodstock.....	26.1	5.2	8.12	0	26	-6.0	16	11.3	35.0	25.0	89	1	10	5	4	25	9	6	14	18
Port Stanley.....	26.3	3.3	18.44	0	26	-1.9	16	13.6	25.4								3.12	+0.12	19	10
Brantford.....	23.5	1.5	18.43	0	29	-3.0	17	13.6	27.0											
•St. George.....	23.8	1.6	7.43	0	18	-4.0	17										2.75	-0.47	14	15
Port Dover.....	24.3	1.4	18.15	9	26	-1.0	17	14.6	26.9								2.71	-0.28	18	13
Guelpi.....	21.0	3.4	10.40	0	26	-3.6	27	20.2	39.6								0.75	-2.40	13	15
Elora.....	21.5	3.7	9.10	0	26	-14.0	17	16.5	35.0								2.48	-0.24	8	21
Petrolia.....	26.2	2.2	6.47	5	24	-6.0	16	16.3	38.0								1.30	-0.94	12	16
•Niagara Falls, S.....	27.0	3.0	6.46	0	23	-0.3	13										1.20	-0.79	8	21
Sault Ste. Marie.....	18.4	1.9	2.41	8	25	-25.5	13	17.9	42.8								2.47	-0.28	12	17
•DeCewsville.....	25.6	2.9	3.43	5	23	-2.0	16										2.96	-0.35	13	16
Sombra.....	27.9	9.9	2.49	2	24	-10.8	13	12.9	43.2								1.48	-0.90	11	18
Mattawa.....	11.6	1.6	4.50	0	24	-22.5	16	26.1	46.4								3.28	-1.51	17	12
Collingwood.....	21.5	3.0	37.0	0	25	-5.0	14	11.5	33.0								2.27	-0.35	15	14
Stoney Creek.....	27.8	7.7	8.42	0	8	0	13	11.5	27.0								3.11	+0.22	15	13
Georgina.....	20.3	4.7	4.49	5	26	-18.0	12	29	6.53	1							4.90	+1.40	10	19
•Sharon.....	21.2	2.4	4.46	1	22	-20.5	13										2.28	-1.17	7	22
Toronto.....	24.7	2.1	5.2	39.1	22	-6.2	13	13.4	21.5	22.8	85	7	17	18	41	18	10	6	5	19
Alton.....	30	15	30	79	29	24	1	55									3.32	-0.70	13	16
Lindsay.....	30	17	30	86	29	23	1	65									2.27	-0.35	15	14
Northwood.....	15.5	1.0	13.37	0	23	-20.0	6	19.1	39.3								3.11	+0.22	15	13
Oshawa.....							6	19.4	34.0								4.90	+1.40	10	19
Deseronto.....	18.1	0.5	18.39	8	22	-13.2	13	17.9	29.5								2.29	-0.46	16	13
Kingston.....	30	15	30	83	29	30	1	47									2.50	-0.31	13	15
Ottawa.....	30	22	28	98	29	31	1	67									2.65	-0.72	8	21
Lakeland.....	17.0	7.1	7.45	0	24	-16.5	13	22.3	44.0								2.59	-0.47	13	17
Alexandria.....	16.6	2.0	3.40	0	23	-21.3	17	18.8	40.6								0.95	-0.98	8	21
Renfrew.....	14.6	1.4	5.50	0	23	-25.2	18	21.3	52.4								3.85	+1.82	8	21
Peterborough.....																	1.55	-0.80	11	18
Barroft.....	16.6	4.2	6.49	1	23	-30.2	16	23.3	47.2								2.30	-0.30	13	16
Haliburton.....	17.8	4.7	3.49	6	23	-25.0	13	16	21	1.48	0									
Chantlar.....	16.3	4.9	4.18	5	24	-21.8	17	20	5.41	6										

RESULT OF OBSERVATIONS at Moose Factory, H. B., November, 1890, to October, 1891, inclusive, Lat. 51° 16' N., Long. 80° 56' W., Height above sea 30.5 ft.

	PRESSURE				TEMPERATURE				WIND			RAIN		SNOW		Thunder	Aurora	Fogs	Clear Days
	Mean	Highest	Lowest	Range	Mean	Highest	Lowest	Range	Mean	Highest	Lowest	Amount	Days	inches	Days				
November, 1890,	29.897	30.508	29.020	1.488	21.48	48.1	-23.0	71.1	4.0	4	13.83	30.6	4	.....	11	.....	3	0	0
December,	29.946	30.612	29.258	1.354	-0.137	38.0	-37.6	75.6	4.1	0	-10.60	22.07	1	.....	11	.....	0	0	3
January, 1891,	29.992	30.670	29.634	1.036	-2.067	29.0	-34.0	63.0	3.4	4	-11.73	20.05	0	.....	11	.....	4	0	0
February,	30.053	30.780	28.800	0.980	-8.60	35.0	-38.6	73.6	3.6	7	-20.81	26.20	0	.....	12	.....	3	0	1
March,	30.155	30.586	29.424	1.162	12.567	48.1	-33.0	81.1	3.7	4	-2.80	27.41	1	.....	5	.....	14	1	0
April,	30.008	30.507	29.104	1.403	29.43	62.1	-6.9	69.0	3.4	3	11.06	26.46	4	.....	3	.....	5	1	2
May,	30.023	30.380	29.743	0.637	33.72	70.1	12.9	57.2	4.9	0	26.93	18.10	7	.....	10	.....	3	0	0
June,	29.937	30.095	29.436	0.659	60.63	89.1	26.0	63.6	3.6	5	43.71	24.81	5	.....	1	.....	1	2	0
July,	29.894	30.188	29.579	0.609	50.88	80.0	36.9	43.1	3.9	2	45.71	20.30	17	.....	0	.....	0	0	0
August,	29.906	30.292	29.903	0.389	60.10	83.1	34.9	48.2	3.6	4	46.75	22.36	12	.....	0	.....	9	3	0
September,	29.946	30.295	29.184	1.111	53.63	78.0	31.9	46.1	3.1	1	46.85	18.29	14	.....	0	.....	4	2	0
October,	29.992	30.637	29.433	1.204	37.10	61.2	21.0	40.2	4.2	1	37.05	13.71	9	.....	7	.....	2	0	1
Sum, or Average,	29.984	30.405	28.800	2.135	29.91	80.1	-38.6	.....	3.8	36	.....	21.20	74	29.0	81	40	48	9	10

PRECIPITATION.

The rainfall throughout the Dominion has with the exception of some part of Ontario been very small.

The general distribution is as follows :—

IN BRITISH COLUMBIA the rainfall was on the coast 1·60 in. In the interior little has fallen.

IN the NORTH-WEST TERRITORIES no rain has fallen.

IN MANITOBA no rain is recorded except a few drops at one or two stations.

IN ONTARIO, West and South-West District it was 1·66 in., or 0·60 in. below the average. In the North and North-West District it was 0·14 in., or 0·40 in. above the average. In the Central District it was 0·77 in., or 0·12 in. above the average. And in the East and North-East District it was 0·06 in., or 0·63 in. below the average.

IN QUEBEC it was 0·05 in., or 0·28 in. below the average.

IN NEW BRUNSWICK it was 0·19 in., or 1·20 in. below the average.

IN NOVA SCOTIA it was 1·39 in., or 0·31 in. below the average.

IN PRINCE EDWARD ISLAND it was inappreciable or 0·80 in. below the average.

Rainfall 5 in. and upwards during month :

B. COLUMBIA.—Port Moody, 5·46 in. ; St. Johns Newfoundland, 6·33 in. ; Bermuda 5·86 in.

Rainfall 1 inch and upwards in 24 hours :—

1. Sarnia, 1·10 in.

2. Niagara Falls S., 1·01 in. ; Watford, 1·00 in. ; Oil Springs, 1·20 in. ; Zurich, 1·25 in. ;

11. Bermuda, 2·11 in.

13. Channel Nfd., 1·20 in. ; St. John, Nfd., 4·05 in.

15. Pictou, 1·21 in.

SNOWFALL.

In Ontario the snowfall has in general exceeded the average, except to the north of Lakes Huron and Superior, where only a trifling quantity has fallen. In the other provinces less than the average has fallen.

The distribution is as follows :—

BRITISH COLUMBIA.—On the coast only a small quantity has fallen, but in the interior upwards of one foot is recorded.

IN N. W. TERRITORIES about 4·5 in. has fallen, or about equal to the average.

IN MANITOBA 7·9 in. has fallen, or about 3 in. below the average.

IN the districts of ONTARIO the amount is 10·2 in., or 0·3 in. above the average; 17·5 in., or 3·0 in. above the average; 17·3 in., or 5·4 in. above the average; 22·0 in., or 6·2 in. above the average.

IN QUEBEC 28·4 in., or 8·8 in. above the average.

IN NEW BRUNSWICK 11·2 in., or 11·2 in. below the average.

IN NOVA SCOTIA 20·8 in., or 2·2 in. above the average.

IN P. E. ISLAND 18·3 in., or 4·4 in. below the average.

Snowfall 15 inches and upwards during month :—

MANITOBA—Posen 16 in., Rathwell 15 in.

ONTARIO—Bancroft, 39 in.; Bognor, 36 in.; Sharon, 31 in.; Norwood, 44 in.; Novar, 18 in.; Belleville, 29 in.; Burk's Falls, 18 in.; Olivers Ferry, 18 in.; Georgetown, 19 in.; Nelson, 15 in.; Huntsville, 20 in.; Thompson, 16 in.; Presqu'Isle, 31 in.; Denbigh, 29 in.; Orangeville, 15 in.; Port Hope, 20 in.; Mount Forest, 20 in.; Glastonbury, 28 in.; Wiarton, 21 in.; Coldstream, 17 in.; Aurora, 21 in.; Orillia, 23 in.; Scarborough, 18 in.; Barrie, 27 in.; Fergus, 24 in.; Midland, 22 in.; Goderich, 15 in.; Beatrice, 15 in.; Gravenhurst, 18 in.; Birnam, 17 in.; Clontarf, 23 in.; St. Mary's, 16 in.; Mattawa, 15 in.; Sprucedale, 24 in.; Owen Sound, 22 in.; Haliburton, 15 in.; Peterborough, 21 in.; Lakefield, 26 in.; Axe Lake, 19 in.; Lucknow, 15 in.; Zurich, 18 in.; Shannonville, 20 in.; Joly, 22 in.; Whiteside, 16 in.; Coldwater, 26 in.; Rockliffe, 15 in.; Kingston, 20 in.; Parry Sound, 25 in.; Saugeen, 21 in.; Ottawa, 25 in.; Alexandria, 25 in.; Lindsay, 32 in.; Durham, 19 in.

QUEBEC—St. Hyacinthe, 22 in.; Point des Monts, 39 in.; Cape Magdalen, 29 in.; Richmond, 28 in.; Lennoxville, 24 in.; Quebec, 15 in.; Father Point, 16 in.; Montreal, 36 in.

NEW BRUNSWICK—Point Lepreaux, 16 in.; Grand Manan, 18 in.; St. Andrews, 25 in.; Chatham, 20 in.; Bathurst, 26 in.; Fredericton, 25 in.;

NOVA SCOTIA—Cow Bay, 28 in.; White Head, 20 in.; Digby, 17 in.; Pictou, 31 in.; Yarmouth, 21 in.; Truro, 26 in.; Sydney, 32 in.; Halifax, 18 in.

P. E. ISLAND—Georgetown, 32 in.

Snowfall 5 in. and upwards in 24 hours :

- 2nd, Bancroft, 6 in. ; Coldwater, 6 in.; Lindsay, 9 in.; Durham, 6 in.; Norwood, 10 in.; Ennismore, 6 in.; Presqu'Isle, 12 in.; Port Hope, 6 in.; Glastonbury, 7 in.; Aurora, 10 in.; Orillia, 5 in.; Scarboro', 5 in.; Barrie, 6 in.; Owen Sound, 6 in.; Peterboro', 6 in.
3rd, Sharon, 16 in.; Orangeville, 9 in.; Georgina, 8 in.; Lakefield, 7 in.
4th, Norwood, 5 in.; Port Hastings, 6 in.; Pictou, 5 in.; Lennoxville, 6 in. Truro, 9 in.; Sydney, 12 in.
5th, Georgetown, 18 in.; Cape Magdalen, 5 in.; Whitehead, 8 in.; St. John, Nfld., 5 in.
6th, Georgetown, 6 in.; White Head, 5 in.; Pictou, 10 in.
7th, Bancroft, 12 in.; Brome, 8 in.; Sault St. Marie, 6 in.; Huntsville, 11 in.; Thompson, 7 in.; Lakefield, 6 in.; Cartier, 6 in.; Digby, 6 in.; Ottawa, 8 in.
8th, Midland, 8 in.; Fort Francis, 9 in.; Mattawa, 6 in.; Sprucedale, 11 in.; Richmond, 10 in.; Parry Sound, 6 in.; St. Andrews, 6 in.; Yarmouth, 7 in.
9th, Lennoxville, 7 in.; St. John, Nfld., 6 in.
10th, Sarnia, 6 in.; Goderich, 6 in.; Birnam, 6 in.; Sombra, 5 in.
11th, Point Clark, 8 in.; Norwood, 9 in.; Point Lepreaux, 7 in.; Wilton Grove, 8 in.; Thompson, 6 in.; Ennismore, 5 in.; Denbigh, 8 in.; Port Hope, 6 in.; Wyoming, 7 in.; Scarboro, 6 in.; Clontarf, 8 in.; St. Mary's, 5 in.; Shannonville, 6 in.; Kingston, 6 in.; Yarmouth, 6 in.; Ottawa, 8 in.; Lindsay, 6 in.
12th, Posen, 6 in.; Belmont, 6 in.; Roseberry, 6 in.; Glastonbury, 12 in.; Coldstream, 6 in.; Renfrew, 5 in.; Lakefield, 5 in.; Lucknow, 5 in.; Zurich, 9 in.; Point des Monts, 22 in.; Point Escuminac, 5 in.; Grand Manan, 6 in.; St. Andrews, 10 in.; Chatham, 7 in.; Father Point, 6 in.; Bathurst, 12 in.; Truro, 5 in.; Fredericton, 12 in.; Sydney, 6 in.
13th, Georgetown, 5 in.; Cape Magdalene, 15 in.; Richmond, 6 in.
14th, Point Clark, 6 in.; Bognor, 6 in.; Norwood, 8 in.; Belleville, 10 in.; Scarborough, 6 in.; Midland, 5 in.; Beatrice, 5 in.; Sprucedale, 6 in.; Peterborough, 6 in.; Shannonville, 6 in.; Cape Magadalene, 6 in.
15th, Bognor, 6 in.; St. Hyacinthe, 5 in.; Glastonbury, 5 in.; Wiarton, 5 in.; Fergus, 7 in.; Owen Sound, 6 in.; Georgina, 5 in.; Lakefield, 7 in.; Point des Monts, 10 in.; Lennoxville, 7 in.; Durham, 6 in.
16th, Griffin Lake, 9 in.
17th, Digby, 6 in.; Pictou, 5 in.; Sydney, 8 in.
18th, Rathwell, 7 in.; Belleville, 6 in.; Cow Bay, 11 in.
19th, Norwood, 5 in.; Wallace, 7 in.; Bathurst, 10 in.
21st, Digby, 5 in.
27th, Posen, 5 in.

Aurora recorded—

Where the class of aurora is noted by the observer it is given (I), being the brightest (IV), the feeblest in brilliancy.

- 1st, Oonikup, Russell, III; Gladstone, Fort Francis, III; Posen, I; Cotham, III; Channel Island, Banff, IV; Grentoft, Winnipeg, Pembina Crossing, II; Yarmouth, IV;
2nd, Russell, III; Glen Adelaide, Posen, II; Winnipeg, Pembina Crossing, IV; Chicoutimi, Minnedosa, II; Quebec, IV; Father Point, II; Truro, II; Sydney, IV.
3rd, Mattawa, Swift Current, III.
4th, Bancroft, IV; Thedford, IV; Chicoutimi.
5th, Oonikup, Savanne, Swift Current, IV.
6th, Russell, III; Father Point, II.
7th, Savanne.
9th, Russell, III, Swift Current, II; Little Forks, II.
10th, Pembina Crossing, II.
13th, Oonikup, I; Gladstone, Savanne, Portage la Prairie, Cartier, Richmond, I; Joly, I; Egremont, Collingwood, Axe Lake, I; Peterborough, II; Pelee Island, Georgina, I; Ridgetown, Haliburton, Sprucedale, Mattawa, Kingsville, Fort Francis, I; Clontarf, Uplands, Gravenhurst, I; Posen, I; Beatrice, Burk's Falls, I; Belleville, St. Hyacinthe, I; Buda, I; Elora, Channel Island, III;

- Banff, IV; Oakbank, Novar, I; Norwood, Niagara Falls, S., Sharon, I; Brome, I; Stony Creek, II; Brandon, I; Elkhorn, I; Winnipeg, I; Pembina Crossing, I; Georgetown, Ont., II; Nelson, I; Huntsville, Cayuga, I; Dealtown, I; Oil Springs, Scarborough, Barrie, Toronto, I; Coldwater, Lennoxville, I; Kingston, IV; Swift Current, II; Port Arthur, I; Port Stanley, II; Quebec, IV; Little Forks, I; Petrolia, I; Virden, I; Ottawa, II; Lindsay, IV; Fredericton, Ridgetown, Montreal, I.
- 14th, Glen Adelaide, Truro, IV; Wallace.
- 15th, Medicine Hat, IV.
- 16th, Conikup, Gravenhurst, IV; Posen, II; Burk's Falls, Chicoutimi, Alexandria, IV.
- 18th, Oonikup, Pictou, Savanne, Channel Island, IV; Hillview, Winnipeg, Pembina Crossing, IV; Minnedosa, IV; Virden, IV; Truro, III; Alexandria, IV;
- 19th, Portage la Prairie, Cape Chatte, Winnipeg, Chicoutimi, Minnedosa, IV; Wallace.
- 20th, Channel Island, IV; Pembina Crossing, IV; Midland, I.
- 21st, Virden, IV.
- 22nd, Little Forks, III.
- 23rd, Russell, II; Henrietta, II; Portage la Prairie, Joly, III; Egremont, Sombra, IV; Mattawa, Clontarf, Gravenhurst, III; Posen, II; Cotham, IV; Burk's Falls, III; Novar, III; Sharon, II; Hillview, Bognor, IV; Point Clark, II; Bancroft, IV; Elkhorn, II; Winnipeg, Pembina Crossing, IV; Coldwater, IV; Minnedosa, III; Medicine Hat, IV; Yarmouth, IV; Father Point, III; Virden, IV; Alexandria, II; Winnipeg, Durham, II.
- 24th, Russell, II; Glen Adelaide, Richmond, IV; Joly, III; Dorchester, Mattawa, Uplands, Burk's Falls, III; Novar, IV; Brandon, III; Kingston, II; Medicine Hat, IV; St. Andrews, IV; Father Point, III; Ottawa, IV; Alexandria, II; Montreal, II.
- 25th, Oonikup, Portage la Prairie, Richmond, IV; Dorchester, Kingsville, Posen, I; Cottam, Grentoft, Hillview, Point Clark, II; Winnipeg, Pembina Crossing, II; Lennoxville, IV; Minnedosa, I; Medicine Hat, IV; Port Arthur, I; Little Forks, III; Virden, IV; Truro, III; Alexandria, III;
- 26th, Dalhousie, Savanne, Cartier, Glen Adelaide, Richmond, III; Joly, III; Egremont, Sombra, III; Georgina, Ridgetown, Mattawa, Kingsville, Fort Francis, IV; Clontarf, Uplands, Birnam, III; Gravenhurst, II; Beatrice, IV; Burk's Falls, IV; Saugeen, II; Father Point, II; Truro, II; Ottawa, II; Alexandria, I; Lindsay, IV; Durham, II; Elora, Sharon, III; Bognor, I; Bancroft, I; Thedford, III; Georgetown, III; Sydney, IV; Ridgetown, Montreal, II; St. Thomas, III; Huntsville, Calvin, Midland, III; Chicoutimi, Toronto, IV; Lennoxville, IV; Kingston, IV; Medicine Hat, II; Edmonton, III; Parry Sound, III.
- 27th, Russell, III; Richmond, IV; Posen III Cotham, IV; Channel Island, IV; Grentoft, Sharon, IV; Hillview, Brome, I; Elkhorn, III; Pembina Crossing, III; Calvin, Chicoutimi, Coldwater, I; Lennoxville, III; Edmonton, II; Virden, III; Alexandria, IV; Fredericton.
- 28th, Russell, II; Henrietta, IV; Savanne, Portage la Prairie, Richmond, IV; Joly, III; Egremont, Sombra, IV; Posen, IV; Cotham, III; St. Hyacinthe, Channel Island, IV; Grentoft, Hillview, Bancroft, IV; Brandon, III; Elkhorn, III; Pembina Crossing, IV; Calvin, Father Point, IV; Truro, III; Ottawa, IV; Alexandria, III; St. Andrews, IV; Quebec, IV.; Montreal, IV; Lindsay, III; Fredericton, Lennoxville, IV; Kingston, II; Minnedosa, III.
- 29th, Oonikup, Russell, III; Savanne, Portage la Prairie, Glen Adelaide, Joly, III; Dorchester, II; Georgetown, Mattawa, Fort Francis, II; Clontarf, Uplands, Posen, I; Channel Island, IV; Banff, IV; Novar, II; Hillview, Brandon, IV; Pembina Crossing, III; Calvin, Swift Current, II; Minnedosa, II; Medicine Hat, II; Parry Sound, II; Charlottetown, IV; Yarmouth, IV; Virden, III; Truro, III; Alexandria, II; Winnipeg, Wallace.

Remarks on the auroral display by observers during month.

Feb. 13th.—LENNOXVILLE, brilliant rose coloured aurora at 7 p.m. LITTLE FORKS, very bright blood red. SAVANNE, northern light at 7 p.m. very brilliant of a reddish colour met overhead like an arch. PORTAGE LA PRAIRIE, purple flashes all over the sky. CARTIER, beautiful coloured corona at 8 p.m. RICHMOND, 7 to 8 p.m. a brilliant aurora was seen in N.-W. extending up to the zenith and afterwards around to the north it was of a brilliant red colour. JOLY, observed at 6 a.m. and again at night the whole northern sky was one red mass of streamers and waves. VIRDEN, beautiful aurora colour deep purple. EGREMONT, grand display at 7 p.m. white, yellow and purple.

COLLINGWOOD, aurora very bright and rose red.

PELFE ISLAND, aurora 6 to 10 p.m. bright red. GEORGINA, very brilliant. HALIBURTON, aurora at 6 a.m. and at 7 p.m., extraordinary bright sky, red, exceptionally fine display. KINGSVILLE, 7 p.m. very bright red. SPRUCEDALE, aurora, crimson very grand. MATTAWA, 8 p.m. red streamers in N. W. UPLANDS, brilliant display. POSEX, near the zenith a small bright spot, the outer edge showed an exceedingly bright light throwing brilliant rays of many colours extending from east to west and overhead; the reflections on the snow was beautiful and the sight was magnificent. GRAVENHURST, a beautiful display of crimson aurora 5 to 6 a.m. and 6 to 8 p.m. BEATRICE, aurora covered two fifths of the sky from N.W. to N.E. the rays of light in the eastern portion being green while the rays in the western half being a beautiful deep crimson, so much so as to give a deep ruddy hue to the snow on the ground: fan shaped. BURK'S FALL, the reflection from the aurora made the snow of a pink appearance. BELLEVILLE, brilliant aurora very red in N. W. St. HYACINTHE, the aurora was the most brilliant seen in ten years. There was no apparent motion in the rays, but these were very well marked and very distinct, they reached almost to the zenith, the most brilliant part was extended horizontally from $\frac{1}{4}$ N. W. to north. It acted very strongly on both the declination and inclination needles.

BUDA, aurora remarkably brilliant.

OAKBANKS, fine aurora, corona, and crimson streams.

LINDSAY, the aurora was of a beautiful red colour.

FREDERICTON, aurora of a peculiar red colour like a shifting cloud of fire.

ESQUIMALT, fine aurora distinctly visible in moonlight at 5 a.m.

NOVAR, brilliant streamers crimson vapor and partial corona.

NORWOOD, brilliant aurora. Niagara Falls, S. Red aurora.

BROME, aurora very bright in the north extended to west; very red. STONEY CREEK, morning display surpassing the evening. BRANDON, aurora very fine.

ELKORN, 7 p.m. very brilliant from E. to W. from horizon to zenith, and of a beautiful wine colour. CAYUGA, grand aurora. OIL SPRINGS, 8 p.m. there was northern light the most brilliant ever seen, white, green and crimson. BARRIE, grand aurora from horizon to zenith. WINNIPEG, magnificent aurora 6 to 7 p.m. PEMBINA CROSSING, weather very stormy. Aurora bright rose pink having a very beautiful effect upon the snow.

TORONTO, 5 a.m. brilliant aurora; bright red in large patches and waves extending from W. to E. and reaching nearly to zenith, from 6.30 to 8.30 p.m. brilliant aurora of an intense red and yellow covering the sky from N. W. to N.N.E., large magnetic disturbance which began suddenly at 0.13 a.m., local time.

Feb. 26th. BEATRICE, aurora from N.E. to N.W. a band of auroral light spanned the sky at an elevation of 45° , streamers of light ascending from the horizon of a green hue. UPLANDS, aurora brilliant 8 p.m. RIDGETOWN, aurora very active. SOMBRA, aurora all night. CARTIER, a fine auroral display 9 to 11 p.m. DALHOUSIE, very brilliant.

Feb. 29th.—PEMBINA CROSSING, aurora extended far to the S. of zenith, violent agitations. SAVANNE, aurora very brilliant. PORTAGE LA PRAIRIE, magnificent display 10 to 12 p.m. POSEX, aurora exceeding bright extending from E. to W. overhead, grand sight.

Thunder recorded on the following date :—

February 7th.—Thedford, Toronto, Princeton, St. Thomas, Nelson, Winona, Cowal, Wyoming, Cayuga, Dealtown, Oil Springs, Scarborough, Stoney Creek, Point Clark, Niagara Falls S., Paris, Birnam, St. Mary's, Kingsville, Ridgetown, Pelee Island, Lucknow, Sombra, Zurich, St. George, Cotham, De Cewsville, Guelph, Woodstock, Ridgetown.

The following arrivals of birds have been noted during February :—

CROWS.—Stoney Creek, 11th; Sharon, 22nd; Cotham, 3rd; Birnam, 24th; Cowal, 26th; Egremont, 20th; Lucknow, 25th.

HORNED SPARROWS.—Sombra, 6th.

ROBINS.—Stoney Creek, 28th; Elora, 20th; Toronto, 17th.

BLUE BIRDS.—Stoney Creek, 28th; Cotham, 27th.

DUCKS.—Lucknow, 24th; Toronto, immense flock of ducks on Humber Bay, 18th.

BLUE JAYS.—Stoney Creek, 24th.

WILD GESE.—Pembina Crossing, 21st; Cotham, 27th; Halifax, 22nd.

HAWKS.—Cotham, 20th.

SONG SPARROWS.—Cotham, 27th.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF FEBRUARY, 1892.

HOURS ENDING

	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.	
ESQUIMALT.....				S.	0 15	0 24	0 32	0 41	0 36	0 47	0 53	0 40	0 19				
AGASSIZ, B.C.				0 60	13	32	36	35	34	33	42	33	13	S.			
BRANDON.....																	
INDIAN HEAD.....				06	18	36	51	49	54	40	51	36	19				
WINNIPEG.....			0 03	35	56	58	57	58	63	57	56	50	12	S.			
KINGSVILLE.....				04	21	26	40	37	39	43	44	42	15				
WOODSTOCK.....				04	22	30	35	31	37	37	36	26	12				
TORONTO.....				17	36	44	45	43	44	47	41	37	24	61			
LINDSAY.....				09	25	35	46	46	47	42	39	34	31	18			
BARRIE.....			S.	08	16	27	35	33	24	28	29	29	22	04			
KINGSTON.....			S.	15	30	40	47	46	42	43	32	36	15				
.....																	
MONTREAL.....				08	25	32	36	40	45	42	45	38	08				
FREDERICTON.....				12	26	35	37	43	55	52	50	36	26	02			
SYDNEY.....			01	08	11	16	21	21	16	18	23	17	07	01			
.....																	
				ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	KINGSVILLE.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)				0 29	0 26		0 37	0 52	0 30	0 25	0 36	0 36	0 24	0 33	0 15	0 36	0 15
MAXIMUM DAILY AMOUNT.....				0 84	0 79		0 80	0 94	0 78	0 84	0 90	0 98	0 88	0 91	0 98	0 94	0 95
DATE				23	23		17	29	26	26	27	27	26	28	28	27	29
NO. OF DAYS COMPLETELY CLOUDED.....				8	8		5	3	9	14	10	11	16	10	12	8	11

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day. The number of predictions issued during the month was 518. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
MANITOBA.....	80	58	16	6	82 5
LOWER LAKE REGION.....	91	79	16	5	85 7
UPPER ST. LAWRENCE.....	88	66	15	7	83 5
LOWER ST. LAWRENCE.....	85	61	16	8	81 2
GULF.....	85	62	14	9	81 2
MARITIME PROVINCES.....	89	68	13	8	83 7
TOTAL.....	518	385	90	43	83 0

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions the reports from the agents at the "Probability Stations," as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer B. C. Webber.

STORM WARNINGS.

During the month warnings on the approach of two storms were issued to our agents, and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 31, of which 21, or 67·7 per cent., were verified. At 5 stations, however, the force did not reach that indicated by the signals displayed; 4 stations reported warnings received late, 2 owing to delay in issue, and 2 to delay in transmission, and 1 station reported a storm for which no warning was sent.

In conjunction with the warnings, predictions as to the probable directions of the wind were given, and of the 21 warnings verified as to force, 21, or 100 per cent., were fully verified.

No. 1. At 11.00 a.m. on the 11th, all stations in the Bay of Fundy, along the Atlantic coast, and those in the Gulf, where navigation continued open, were warned for a fresh to heavy easterly gale. At the time two cyclones were approaching these districts, one being over the Lake district and the other over the Middle Atlantic States. These coalesced during the 11th, and passed as a single depression northeast over the Maritime Provinces. A fresh to heavy gale set in during the 11th at all stations, and continued till the evening of the 12th. It was accompanied by a heavy fall of snow or sleet, and is reported by incoming vessels to have been exceptionally severe out at sea.

No. 2. At 9.30 p.m. on the 14th all eastern stations were warned for a fresh easterly gale in advance of an important cyclone then central over the Lower Lakes, which was moving north-eastward. On reaching the Maritime district next day, however, it dispersed. It caused a moderate gale or strong wind in portions of the Bay of Fundy; otherwise no storm occurred.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR FEBRUARY, 1892.

The month was remarkable for the large number of disturbances recorded, the storm of the 13th being the most important recorded at the Observatory since November, 1882. The storm was accompanied by a brilliant aurora.

A slight disturbance prevailed on the 1st, at 11 p.m., it became more important, and at 11·17 an easterly sweep of 38' began, the extreme reading taking place at 11.37 p.m. The magnet then slowly recovered its normal reading, but it was not until the morning of the 7th that it shewed any tendency to quiet down. The 2nd, 4th and 5th were the most disturbed. A close resemblance is shewn between the changes on the 4th and 5th, the movements on the latter date were considerably greater.

On the night of the 7th, slight disturbing action began, and continued to the 12th. At 0·16 a. m. or 0.34 (75° m. t.) of the 13th, a large storm began. The declination magnet was suddenly deflected to the east, immediately afterwards a gradual westerly movement set in. After 2 p.m. the disturbance became more active, and between 4 and 10 a.m. the vibrations were very rapid, during the early morning hours the magnet was considerably west of its normal reading. After 10 a.m. the magnet moved east, oscillating violently at the same time. It remained east of the normal until 4 p.m. At 3.48 p.m. a rapid westerly swing of 1° 23' in about five minutes was recorded. Another large westerly movement was recorded at 6.25 p.m., of 1° 25' in about three minutes, a quick recovery of 1° 17' followed, rapid oscillations then began, and after 7.15 p.m. the magnet commenced to move west, and by 11 p.m. was considerably west of its mean position. After midnight the disturbance abated considerably. Still the magnets were very unsteady up to noon. The greatest westerly reading took place at 7.33 a.m., being 41' west of the normal. The extreme easterly took place at 6.27, being 1° 41' east of the normal, the total range being over 2° 32'. On the 14th at 5·17, a marked westerly extreme was recorded, after which some very rapid oscillations followed. Both forces at the commencement of this disturbance were suddenly increased, after which a general decrease followed. On the v. f. curve, a marked decrease of ·0038 c. g. s. was recorded at 2.40 a.m. of the 13th. A quick recovery followed.

Between 4 and 10 a.m. some rapid changes occurred, especially of the horizontal force. The v. f. was rapidly increased between 10 and noon. Between 0.20 and 8.30 a.m. the h. f. decreased ·0076 c. g. s. After 8.30 a.m. a recovery began and by 3.48 p.m. the h. f. increased ·0144 c. g. s., the spot of light then going off the paper. At 4.04 the spot came on and immediately afterwards a rapid diminution of force began, after recovering, a series of large sweeps occurred. The most rapid changes however took place about 6.30 p.m., when some exceedingly pretty movements were

recorded and the force then commenced to fall, the vibrations greatly diminishing. A little after 11 p.m. an increase set in. Between 4 and 7 a.m. the next morning the force was again changing rapidly, a marked minimum taking place at 5.20 a.m.

The v. f. curve in the afternoon and night presents one continued series of vibrations. Up to 2.30 p.m. the v. f. was considerably above its normal value. At 3.52 p.m. a marked minimum was recorded. At 6.26 p.m. a rapid increasing movement began. This was followed by violent vibrations, afterwards the magnet gradually quieted down. During the storm the total change of v. f. was 101509 C. G. S.

On the 15th slight disturbing action was shown up to 8 p.m. when a quiet curve followed. On the 20th and morning of the 21st there was an absence of any larger movements, but the magnets were decidedly disturbed. Slow waves of disturbance were registered on the night of the 23rd and morning of the 24th. A little before 5 p.m. of the 25th a moderate disturbance set in, it ceased during the next afternoon, but appeared again that evening and gradually became less active, the movements were undulatory. Slight irregularities are shown on the nights of the 27th and 28th. On the 29th at 9 p.m. an easterly movement of 48 began and the month closed with the magnets in a slightly disturbed condition. The force magnets showing a decrease.

On the 13th at 5 a.m. brilliant aurora, bright red, in large patches and waves extending from W. to E. and reaching nearly to zenith (class I). At 6 a.m. aurora still visible in N. E. In the evening brilliant aurora visible over N. sky, intense red and yellow. On the 26th faint auroral light at midnight. On the 3rd, 6th, 15th, 16th, 17th, 24th, the sky was clear, but no aurora was observed. On all other nights clouds or haze would have hidden any aurora which might have existed. Brilliant auroras were observed throughout Canada on the 13th.

CHARLES CARPMAEL,

Director.

METEOROLOGICAL OFFICE,
TORONTO, April 12th, 1892.



METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

MARCH, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years in Ontario and Manitoba and some part of the North-West Territories. Elsewhere it was below the normal except on the Pacific Coast.

The more important features of the month, were a strong gale and heavy fall of snow and rain, which occurred on the 3rd and 4th in the Maritime Provinces, and an immense anti-cyclone which spread over nearly the whole continent between the 11th and 17th.

From the 1st until the 4th, anti-cyclonic conditions prevailed over the greater part of the country; the weather was generally fine and cold over the Lake and Eastern districts, but more moderate temperatures were prevalent over the North-West, and a moderate cyclone hovered over Alberta. A cyclone which moved up the Atlantic coast along the eastern limits of the anti-cyclone, reached the Maritime Provinces at night on the 3rd. It had already during that day and the previous one caused a steepening of barometric gradients and high N.E. winds over the Maritime district, and a heavy snowstorm in their southern portion, which by night of the 3rd turned to rain and extended over the whole of this district. The cyclone took a course due N.W. crossing Nova Scotia, being centred over the Bay of Chaleur on the night of the 5th, then turning it moved south-eastward out to sea and afterwards apparently moved N.E. from the coast over Newfoundland when the weather cleared up in Eastern Canada.

Fine weather with a slight upward temperature tendency and slow but general decrease in pressure, were prevalent throughout the rest of the country until the 8th, when an important but small cyclone formed over Alberta and moved quickly south-eastward. It gave a general fall of snow throughout the North-West accompanied by high northerly winds.

On the same day another cyclone of less importance, which had moved up from the Gulf of Mexico, gave a fall of sleet and rain in Southern Ontario. It took a N.E. course passing over the Gulf of St. Lawrence causing a moderate fall of sleet or rain in Quebec and New Brunswick and a heavy fall of rain in Nova Scotia.

On the 10th, the North-West cyclone passed over the Lakes with increasing energy and a light snow fall and lower temperatures occurred. By next morning it had developed into an important storm, a decided change to colder weather set in over Ontario and the wind was blowing a N.W. gale. During the day the cyclone moved north-eastward to the Gulf of St. Lawrence causing a general fall of rain turning to snow, a S.W. to N.W. gale and decidedly colder weather throughout Eastern Canada. It had been followed over the North-West by an important anti-cyclone, causing the temperature to fall as low as -18° to -20° in Assiniboia and Manitoba. This anti-cyclone passed over the Lake district on the 11th and south-eastward to the Gulf of Mexico. A slight depression gave some snow in Ontario but was soon absorbed by the cyclone over Eastern Canada which continued to hover and cause a north-westerly gale over the Gulf of St. Lawrence till the 14th, and decidedly cold weather throughout Eastern Canada.

An anti-cyclone, which first appeared over the North-West Territories on the 11th, soon spread over the whole of these Territories and extended to the Gulf of Mexico, and on the 14th covered the greater part of the continent, being accompanied by abnormally cold weather everywhere. The pressure in its centre rose to 31.10 inches. This immense anti-cyclone hovered over the greater part of the continent till the 17th when a cyclone which had

been causing a heavy rainfall over the Southern Gulf States, moved across Georgia to the Atlantic coast ; from thence it took a north-east course, passing across the Gulf of St. Lawrence on the 21st. A general snow storm set in on the 18th over the Lake and Eastern districts. The fall was moderate over Ontario, but heavy in the Eastern provinces, turning to rain in the Maritime provinces. The cyclone developed into an important storm and a fresh gale occurred from the E., backing to W. in Quebec and from the S.E., veering to W. in New Brunswick and Nova Scotia during the 19th and 20th.

The anti-cyclone again reasserted itself covering the greater part of the continent on the 21st. Fine weather and decidedly cold night temperatures prevailed everywhere in Canada, excepting only Alberta and British Columbia, where temperatures were more moderate. A quick eastward movement of the anticyclone took place and it passed off the Middle Atlantic coast on the 22nd. A cyclone moved up its western side from Texas, passing over Ontario on this day, giving a general fall of sleet and rain over Ontario. From the Lakes it moved eastward to the Gulf of St. Lawrence, causing a general fall of snow or rain during the 23rd and 24th throughout Quebec and the Maritime Provinces.

Anti-cyclonic conditions followed on the 25th over the Lake and Eastern districts, accompanied by fine weather and moderate temperature.

From 21st until the 26th, a cyclone prevailed over the North-West Territories. The weather being generally fair with moderate temperatures. On the 26th there were some showers and local falls of sleet or snow, more particularly in Assiniboia and Manitoba ; then a general increase in pressure and fine weather set in over the whole North-West. This continued till the 28th, when a general decrease in pressure took place, and cloudy unsettled weather set in with local showers and moderate temperatures. These conditions prevailed till the end of the month.

On the 26th a cyclonic trough stretched from Manitoba to Florida, in which by night a cyclone developed some energy, being then centred over Illinois, from thence it moved due east to the Atlantic Coast. It caused high N.E. winds in the Lake District on the 27th. It did not otherwise affect Ontario and the Eastern Provinces where the weather continued fine with fresh N.E. to N. W. winds. On the 28th, generally anti-cyclonic conditions obtained over these districts which continued till the end of the month, the weather being fine and cool.

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations was nowhere very different from the normal of eighteen years except in Manitoba where it was several degrees above normal.

The highest and lowest Temperatures in each Province during March were:

B. COLUMBIA, 74°·0 on 15th, at Agassiz ; 10°·0 on 11th, at Barkerville.

N. W. TERRITORIES, 64°·0 on 10th, at Calgary ; —36°·9 on 14th, at Henrietta.

MANITOBA, 50°·5 on 30th, at St. Alban's ; —29°·8 on 15th, at Minnedosa.

ONTARIO, 68°·0 on 8th, at Welland ; —27°·5 on 20th, at Savanne.

QUEBEC, 48°·9 on 31st, at St. Hyacinthe ; —19°·2 on 2nd, at Chicoutimi.

N. BRUNSWICK, 48°·8 on 10th, at St. Andrew's ; —7°·0 on 14th, at Dalhousie.

NOVA SCOTIA, 52°·5 on 19th, at Truro ; 2°·0 on 15th, at Pictou.

P. E. ISLAND, 45°·4 on 9th, at Georgetown ; 2°·6 on 15th, at Kilmahumauig.

ONTARIO—Continued.																																
Novar.....	19-2	-0.1	551.1	26	-17.5	16	27-5 48-2	.....	4	1	5	4	0	5	0	0	4	18	46	82	W	14NW	0-58	-2.06	9.22	11	0	0			
Little Forks.....	16-1	-6.2	1 69-0	30	-24.5	20	25-7 30-1	.....	88	4	2	23	5	10	6	20	21	4	4	0	93	W	9NW	0-10	+0.16	3.28	4	0	0		
Waukegan.....	16-4	.....	46.1	8	-25.0	20	24-9 38-1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0-45	-2.00	4.27	0	1	0	0			
Fort Francis.....	24-6	-3.2	347.0	31	-2.0	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shannonville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
QUEBEC:																																
Montreal.....	29 96	20-53	29-03	1-50	23-3	-0.7	18.40-8 28-52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Hyacinthe.....	21-8	-4.8	145.0	31	-10-0	16	18-5 31-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond.....	20-0	-2.0	1548-9	31	-15-9	16	19-2 40-6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicoutimi.....	17-2	-0.1	1342-7	11	-19-2	2	21-9 41-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quebec.....	20 9	-0.3	1541-1	28	-4-5	15	15-9 29-8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Levesville.....	29-80	30-13	29-07	1-56	20 9	-0.3	1541-1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Levesville.....	29-87	30-51	29-05	1-49	23-3	45-2	31	-15-0	11	-15-0	16	17-7 30-5
Brome.....	18-3	45-2	31	-15-0	11	-15-0	16	17-7 30-5
Father Point.....	20-1	0-0	1837-5	10	-9-9	3	14-0 28-6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Point des Monts.....	17-7	-0.6	841-0	7	-15-0	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cape Chatte.....	23 0	-1.4	336-0	7	-5-0	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ricquet.....	.....	.....																												

STATIONS NOT ENTERED IN FEBRUARY REVIEW 1891.

PROVINCE.	STATION.	MEAN Temp.	HIGHEST TEMPERATURE.		LOWEST TEMPERATURE.		PRECIPITATION.		AURORAS.	THUNDER STORMS.
			Temp.	Date.	Temp.	Date.	Amount.	Days.		
		°	°			°		in.		
British Columbia	Fort Simpson	36.96	49.5	25	19.6	1	7.75	19		
Manitoba	St. Albans	3.93	36.0	21.24	—32.5	15	0.89	12		
New Brunswick.	Parkers Ridge	16.07	41.0	22	—20.0	29	2.56	6		

PRECIPITATION.

The rainfall in the Maritime Provinces has exceeded the average, also in Manitoba and the North-West Territories; in the other parts of the Dominion, especially in Ontario a marked deficit occurred, the fall of snow being also much less than usual.

The general distribution is as follows:—

In BRITISH COLUMBIA the rainfall was on the coast 2.75 in. In the interior little has fallen.

In the NORTH-WEST TERRITORIES it was 0.26 in. or about the same as in 1891.

In MANITOBA rain is recorded at a number of stations to the amount of 0.26 in.

In ONTARIO, West and South-West District it was 0.81 in., or 0.96 in. below the average. In the North and North-West District it was 0.18 in., or 0.81 in. below the average. In the Central District it was 0.66 in., or 0.75 in. below the average. And in the East and North-East District it was 0.35 in., or 1.31 in. below the average.

In QUEBEC it was 0.31 in., or 0.43 in. below the average.

In NEW BRUNSWICK it was 2.13 in., or 0.36 in. above the average.

In NOVA SCOTIA it was 4.36 in., or 2.01 in. above the average.

In PRINCE EDWARD ISLAND it was 2.99 in. or 1.20 in. above the average.

Rainfall 5 in. and upwards during month:—

B. COLUMBIA. Agassiz, 6.01 in.; Fort Simpson, 7.67 in.; Port Moody, 6.31 in.

NOVA SCOTIA. Sydney, 5.88 in.

Rainfall 1 inch and upwards in 24 hours:—

2. Bermuda; 1.97 in.

4. Port Hastings, 2.00 in.; Fort Simpson, 1.43 in.; Sydney, 2.36 in.

5. Channel, 1.30 in.; Kilmahuinaig, 1.09 in.; Fort Simpson, 1.30 in.

7. Agassiz, 1.13 in.; Esquimalt, 1.03 in.

8. Rose Hill, 1.15 in.; Port Moody, 1.30 in.

9. Cow Bay, 1.10 in.; White Head, 1.79 in.; Port Hastings, 1.00 in.; Truro, 1.05 in.; Yarmouth, 1.20 in.; Sydney, 1.27 in.; Halifax, 1.45 in.

11. Digby, 3.00 in.

19. Kilmahuinaig, 1.11 in.; Port Hastings, 1.05 in.; Point Lepreance, 2.60 in.; Digby, 1.00 in.; St. John, 2.94 in.; Halifax, 1.12 in.; Parkers Ridge, 1.25 in.

19. Bermuda, 1.25 in.

SNOWFALL.

The snowfall has been less than the average, the deficit being greatest in the Central and Northern parts of Ontario.

The distribution is as follows:

BRITISH COLUMBIA.—On the coast only a small quantity has fallen, but in the interior upwards of 10 in. is recorded.

In N. W. TERRITORIES about 4 in. has fallen, or about 1 in. above that of 1891.

In MANITOBA 5.2 in. has fallen, or about 0.6 in. below the average.

In the districts of ONTARIO the amount is 5.3 in., or 12.5 in. below the average; 8.9 in., or 13.0 in. below the average; 5.6 in., or 17.5 in. below the average; 11.0 in., or 9.9 in. below the average.

In QUEBEC 23.2 in., or 3.9 in. above the average.

In NEW BRUNSWICK 20.1 in., or 1.1 in. below the average.

In NOVA SCOTIA 14.5 in., or 2.9 in. below the average.

In P. E. ISLAND 0.8 in., or 6.7 in. below the average.

Snowfall 15 inches and upwards during month :—

MANITOBA—Hillview, 16 in.

ONTARIO—Denbigh, 15 in. ; Glastonbury, 16 in.; Mount Forest, 19 in.; Sunshine, 20 in.; Joly, 15 in.; Clontarf, 38 in.; Alexandria, 17 in.; Ottawa, 23 in.; Saugeen, 24 in.

QUEBEC—Cape Magdalen, 34 in.; Richmond, 15 in.; Chicoutimi, 17 in.; Point des Monts, 57 in.; Father Point, 31 in.; Quebec, 19 in.; Montreal, 35 in.

NEW BRUNSWICK—Dorchester, 20 in. ; Point Lepreaux, 28 in. ; Dalhousie, 16 in.; Chatham, 22 in.; Grand Manan, 21 in.; St. Andrews, 24 in.; Fredericton, 26 in.; St. John, 17 in.; Parker's Ridge, 28 in.

NOVA SCOTIA—Digby, 34 in.; Truro, 17 in.; Yarmouth, 32 in.; Halifax, 15 in.

Snowfall 1 in. and upwards in 24 hours :—

2nd, Yarmouth, 6 in.

3rd, Digby, 24 in.; Point Lepreaux, 14 in.; Truro, 7 in.; Grand Manan, 6 in.; St. Andrew's, 11 in.; Yarmouth, 11 in.; St. John 8 in.

4th, Point Escuminac, 6 in.; Dorchester, 9 in.; Dalhousie, 5 in.; Father Point, 6 in.; Grand Manan, 6 in.; Parker's Ridge, 6 in.

5th, Cape Magdalen, 18 in.; Point des Monts, 11 in.; Father Point, 8 in.; Parker's Ridge, 8 in.

6th, Point des Monts, 10 in.; St. Andrew, 5 in.

7th, Glastonbury, 11 in.

8th, Hillview, 16 in. ; Glen Adelaide, 8 in.; Elkhorn, 13 in.; Morden, 12 in.; Fairburn, 6 in.; Roseberry, 6 in.; Shoal Lake, 10 in.; Turtle Mountain, 8 in.; Pembina Crossing, 5 in.; Hartney, 6 in.; Rapid City, 8 in.

9th, Mattawa, 5 in.; Calvin, 5 in.; Point des Monts, 5 in.

10th, Denbigh, 8 in.; Clontarf, 30 in.; Ottawa, 8 in.

11th, Mount Forest, 6 in.; Sunshine, 8 in.; Point des Monts, 10 in.; Deseronto, 5 in.; Ottawa, 5 in.; Montreal, 16 in.

12th, Port Hope, 6 in.; Wiarton, 6 in. ; Presqu'Isle, 6 in.; Bognor, 6 in.; Richmond, 6 in.; Point des Monts, 5 in.; Owen Sound 5 in.; Edmonton, 6 in.

15th, Owen Sound, 5 in.; Saugeen, 9 in.

17th, Truro, 6 in.

18th, Stoney Creek, 6 in.

19th, Niagara Falls S., 5 in.; Point des Monts, 12 in.; Alexandria, 6 in.; Father Point, 9 in.; Quebec, 6 in.

20th, Richmond, 6 in.; Lennoxville, 6 in.

21st, Glastonbury, 5 in.

22nd, Buda, 6 in.

23rd, Pictou, 5 in.; Alexandria, 5 in.; Parker's Ridge, 5 in.

24th, Channel, 6 in.; Sydney, 7 in.

25th, Cape Magdalen, 10 in.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1st, Dorchester, Novar, IV ; Sharon, Bancroft, IV ; Banff, IV ; Clontarf, IV ; Uplands, Richmond, IV ; Joly, Henrietta, II ; Georgetown, IV ; Calvin, Huntsville, Glen Adelaide, Mattawa, Zurich, Elora, St. Albans, III ; Nelson, I ; Stoney Creek, III ; Gravenhurst, IV ; Alexandria, II ; Truro, I ; Port Arthur, I ; Saugeen, IV ; Father Point, III ; Quebec, IV ; Medicine Hat, IV ; Minnedosa, I ; White River, IV ; Fredericton, Winnipeg, Toronto, III, Durham, II.

2nd, Pembina Crossing, IV ; Elkhorn, II ; Georgina, Bancroft, IV ; Posen, II ; Clontarf, IV ; Henrietta, Sharon, I ; Georgetown, IV ; Calvin, Glen Adelaide, Sombra, IV ; Elora, Nelson, I ; Russell, III ; Gravenhurst, IV ; Alexandria, III ; Father Point, IV ; Quebec, IV ; Medicine Hat, IV ; Minnedosa, III ; Esquimalt, III ; Toronto, III.

3rd, Egremont, III ; Pembina Crossing, IV ; Elkhorn, III ; Posen, IV ; Calvin, Glen Adelaide, Saskatoon, Hillview, Alexandria, II ; Deseronto, I ; Ottawa, IV ; Edmonton, II ; Medicine Hat, IV.

4th, Savanne, Calvin, Saskatoon, Deseronto, I.

5th, Beatrice, IV ; Clontarf, IV ; Calvin, Elora, Edmonton, II ; Esquimalt, IV.

- 6th, Point Clark, II ; Egremont, II ; Elkhorn, II ; Georgina, Beatrice, III ; Buda *fine*, Carter, *very fine*, Novar, II ; Bancroft, II ; Uplands, Joly, Welland, Haliburton, II ; Peterborough, II ; Niagara Falls, South, Bogaor, II ; Sharon, IV ; Georgetown, III ; Thedford, IV ; Cayuga, IV ; Calvin, Burk's Falls, III ; Ridgetown, Mattawa, Sombra, III ; Kingsville, IV ; Zurich, Brantford, Ne'son, II ; Hillview, Russell, II ; St. Thomas, II ; Barrie, IV ; Stoney Creek, II ; Gravenhurst, II ; Lindsay, III ; London, I ; Alexandria, I ; Coldwater, I ; Deseronto, II ; Ottawa, II ; Little Forks, II ; Port Arthur, IV ; Parry Sound, III ; Saugeen, IV ; Port Dover, IV ; Port Stanley, III ; Guelph, IV ; Woodstock, Kingston, I.
- 7th, Egremont, II ; Brandon, IV ; Scarborough *bright*, Russell, II ; Belleville *brilliant*, Deseronto, III ; Little Forks, II.
- 9th, Pembina Crossing, IV.
- 11th, Beatrice, IV ; Novar, IV ; Bancroft, III ; Uplands, Joly, Haliburton, Huntsville, Gravenhurst, IV.
- 12th, Pembina Crossing, III ; Winnipeg, Whiteside, Georgina, Beatrice, II ; Novar, III ; Bancroft, II ; Clontarf, II ; Jolly, Henrietta, Burk's Falls, IV ; Russell, II ; Alexandria, I ; Edmonton, III ; Winnipeg, Kingston, III ; Toronto, II.
- 13th, Rapid City, Scarborough.
- 14th, Kingston, I.
- 15th, Elkhorn, I ; Dorchester, Beatrice, IV ; Novar, IV ; Chicoutimi, III ; Clontarf, IV ; Joly, Uplands, Sharon, II ; Burk's Falls, IV ; Georgetown, P.E.I., Mattawa, Zurich, Birman, IV ; Gravenhurst, IV ; Alexandria, I ; Ottawa, IV ; Truro, IV ; Port Stanley, IV ; Father Point, III ; Quebec, IV ; Fredericton, Kingston, II.
- 16th, Posen, II ; Savanne, Little Forks, II.
- 17th, Savanne, Georgetown, P.E.I., Minnedosa, III.
- 18th, Brandon, III.
- 20th, Pembina Crossing, IV.
- 21st, Chicoutimi, IV ; Savanne, Grand Manan, IV.
- 22nd, Savanne, Grand Manan, VI.
- 23rd, Pembina Crossing, IV ; Elkhorn, II ; Savanne, Russell, III ; Alexandria, II.
- 24th, Egremont, IV ; Pembina Crossing, II ; Dorchester, Georgina, Beatrice, III ; Novar, III ; Clontarf, IV ; Uplands, Fort Francis, Joly, Savanne, Bognor, IV ; Sharon, II ; Georgetown, IV ; Thedford, II ; Cayuga, III ; Burk's Falls, II ; Ridgetown, Lucknow, Zurich, Wallace, I ; Russell, IV ; Birnam, IV ; Truro, III ; Little Forks, II ; Parry Sound, II ; Port Stanley, IV ; Quebec, IV ; White River, III ; Yarmouth, IV ; Sydney, IV ; Fredericton, Winnipeg, III ; Halifax.
- 25th, Point Clark, III ; Egremont, IV ; Posen, I ; Clontarf, IV ; Savanne, Bognor, IV ; Sharon, II ; Georgetown, IV ; Sombra, III ; Kingsville, IV ; Lucknow, Zurich, Elora, Birnam, IV ; Stoney Creek, III ; Alexandria, I ; Port Arthur, I ; Grand Manan, IV ; Quebec, IV ; Minnedosa, III ; White River, III ; Sydney, III ; Winnipeg, III ; Toronto, III.
- 26th, Dalhousie, Egremont, IV ; Pembina Crossing, IV ; Elkhorn, II ; Georgina, Novar, IV ; Bancroft, IV ; Posen, II ; Clontarf, IV ; Richmond, IV ; Joly, Brandon, IV ; Savanne, Sharon, I ; Georgetown, IV ; Mattawa, Elora, Hillview, III ; Stoney Creek, IV ; Gravenhurst, IV ; Lindsay, IV ; Alexandria, II ; Ottawa, III ; Quebec, IV ; Swift Current, II ; White River, IV ; Sydney, IV, Fredericton, Lennoxville, IV.
- 27th, Dalhousie, Egremont, II ; Pembina Crossing, III ; Rapid City, Elkhorn, III ; Beatrice, IV ; Novar, III ; Bancroft, IV ; Chicoutimi, III ; Posen, II ; Clontarf, IV ; Uplands, Richmond, IV ; Brandon, III ; Savanne, Bognor, IV ; Sharon, III ; Georgetown, IV ; Thedford, I ; Point Escuminac, Calvin, Burk's Falls, II ; Ridgetown, Mattawa, Elora, St. Albans, II ; Hillview, Russell, III ; Gravenhurst, IV ; Lindsay, IV ; Alexandria, II ; Coldwater, I ; Quebec, IV ; Minnedosa, II ; Yarmouth, IV ; Sydney, IV ; Fredericton, Kingston, II ; Toronto, IV ; Lennoxville, III.
- 28th, Point Clark, III ; Dalhousie, Egremont, III ; Rapid City, Dorchester *brilliant*, Novar, IV ; Savanne, Bancroft, III ; Chicoutimi, III ; Uplands, Richmond, III ; Joly, Welland, Peterborough II ; Bognor, II ; Sharon, II ; Georgetown, IV ; Thedford, II ; Point Escuminac, Calvin, Burk's Falls, II ; Ridgetown, Mattawa, Lucknow, Elora, Pelee Island, Birnam, IV ; Gravenhurst, IV ; Lindsay, IV ; Alexandria, II ; Deseronto, II ; Ottawa, IV ; Truro, III ; Port Arthur, II ; Port Stanley, III ; Father Point, III ; Quebec, IV ; Sydney, III ; Fredericton, Winnipeg, III ; Charlottetown, Toronto, III ; Durham, I.
- 29th, Elkhorn, I ; Dorchester, Georgina, Novar, IV ; Bancroft, IV ; Chicoutimi, IV ; Posen, IV ;

Henrietta, Sharon, I ; Point Escuminac, Calvin, Burk's Falls, IV : Elora, St. Albans, II ; Alexandria, IV : Quebec, Kingston, IV : Toronto, IV.

30th, Pembina Crossing, IV ; Dorchester, Richmond, IV ; Point Escuminac, Calvin, Gravenhurst, Truro, IV : Quebec, IV : Medicine Hat, IV : St. Andrews, IV : Fredericton, IV : Halifax, IV : Kingston, IV.

31st, Novar, IV ; Chicoutimi, IV ; Richmond, IV ; Calvin, Georgetown, P.E.I., Alexandria, III ; Truro, IV ; Father Point, III ; Quebec, IV ; Medicine Hat, IV ; Sydney, IV : Fredericton, Halifax, IV : Charlottetown, IV.

Appearance of Spring Birds, &c.

CROWS.—Point Clark, 1st ; Roseberry, 25th ; Treherne, 26th ; Rapid City, 30th ; St. Mary's, 23rd ; Georgina, 7th ; Gravenhurst, 5th ; Posen, 11th ; Haliburton, 8th ; Thamesville, 3rd ; Thedford, 2nd ; Paris, 2nd.

BLUE BIRDS.—Egremont, 25th ; DeCewsville, 12th ; Shannonville, 23rd ; Georgetown, 24th ; Thedford, 12th ; Ennismore, 31st ; Dealtown, 18th ; Cowal, 6th ; Scarboro, 23rd ; Princeton, 28th ; Oil Springs, 7th ; Birnam, 4th ; Toronto, 26th ; Lennoxville, 27th.

ROBINS.—Point Clark, 26th ; Egremont, 10th ; St. Mary's, 23rd ; Owen Sound, 26th ; DeCewsville, 11th ; Bancroft, 30th ; Welland, 27th ; Shannonville, 23rd ; Bognor, 26th ; Georgetown, 8th ; Thedford, 25th ; Ennismore, 31st ; Wiarton, 29th ; Cowal, 3rd ; Ridgetown, 8th ; Lucknow, 7th ; Brantford, 14th ; Collingwood, 24th ; Midland, 29th ; Princeton, 12th ; Wyoming, 8th ; Blenheim, 3rd ; Oil Springs, 25th ; Birnam, 2nd ; Gravenhurst, 23rd ; Toronto, 3rd.

GREY BIRDS.—De Cewsville, 25th ; Scarboro, 20th ; Winona, 30th.

GEESE.—Roseberry, 31st ; Belmont, 29th ; Pilot Mound, 30th ; Pembina Crossing, 5th ; Greenwood, 29th ; Rapid City, 29th ; Cowal, 1st ; Kilmahumaig, 16th ; Saskatoon, 30th ; Russell, 29th ; Oil Springs, 27th ; Toronto, 29th.

DUCKS.—Treherne, 28th ; Belmont, 29th ; Pembina Crossing, 27th ; Saskatoon, 30th.

WAVEYS.—Pembina, 28th. SONG SPARROW.—Cowal, 23rd ; Toronto, 26th.

MEADOW LARKS.—Point Clark, 22nd ; Treherne, 5th ; De Cewsville, 19th ; Thedford, 12th ; Toronto, 25th.

BLACK BIRDS.—Point Clark, 31st ; Egremont, 26th ; Pembina Crossing, 31st ; St. Mary's, 23rd ; Cowal, 12th ; Lucknow, 29th ; Zurich, 24th ; Princeton, 28th ; Owen Sound, 26th ; De Cewsville, 25th ; Welland, 27th ; Bognor, 29th ; Presqu'Isle, 31st ; Thedford, 7th ; Birnam, 23rd ; Toronto, 17th.

SWALLOWS.—Welland, 27th ; Quamichan, 9th ; Gravenhurst, 31st ; Toronto, 21st.

BUTTERFLIES.—Whiteside, 26th ; Quamichan, 10th ; Lennoxville, 31st.

FROGS.—Kingsville, 31st ; Lucknow, 30th ; Zurich, 31st ; Oil Springs, 26th ; Birnam, 26th.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF MARCH, 1892.

HOURS ENDING

	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.
ESQUIMALT			8	0.23	0.27	0.32	0.36	0.46	0.51	0.46	0.42	0.36	0.22	S.	..	..
AGASSIZ, B.C.				63	21	28	29	33	38	37	28	19	07	S.	..	..
BRANDON.....				20	39	47	51	58	55	57	52	43	25		..	..
INDIAN HEAD.....					24	42	48	51	53	56	60	47	01		..	..
WINNIPEG.....			18	38	45	50	54	59	61	62	61	60	45	09	..	..
KINGSVILLE.....				32	42	47	49	51	55	55	56	47	21		..	..
WOODSTOCK.....		S.	12	30	40	41	41	51	50	49	45	42	31	09	S.	..
TORONTO.			16	55	55	54	51	55	58	64	59	57	50	15		..
LINDSAY.....			16	29	53	62	63	59	59	59	59	56	43	41	13	..
BARRIE.....			05	35	50	50	63	62	56	56	53	52	50	21	..	..
KINGSTON			02	42	54	55	62	64	67	65	66	67	68	61	..	..
.....																
MONTREAL.....			12	35	48	51	57	59	57	57	57	52	37	02	..	..
FREDERICTON			02	42	47	52	49	54	61	58	55	48	49	62	..	..
SYDNEY.....			15	27	25	32	34	33	35	36	32	24	20	12	..	..

	ESQUIMAULT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	KINGSTOWN.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH (Constant sunshine being 1)	0.30	0.20	0.58	0.33	0.47	0.38	0.37	0.49	0.51	0.46	0.53	0.50	0.45	0.26
MAXIMUM DAILY AMOUNT.	0.84	0.51	0.80	0.80	0.90	0.80	0.84	0.90	0.90	0.91	0.91	0.96	0.90	0.93
DATE	10	15	14	9	14	2	6	6	2	28	3	13, 26 20, 30	21	31
NO. OF DAYS COMPLETELY CLOUDED.	19	10	6	7	3	5	8	3	4	5	5	10	6	10

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 621. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
MANITOBA	97	6	15	16	7.8
LOWER LAKE REGION	106	68	19	19	7.1
UPPER ST. LAWRENCE	102	76	14	12	81.4
LOWER ST. LAWRENCE	101	78	12	11	81.6
GULF	102	79	8	15	81.4
MARITIME PROVINCES	111	76	18	17	70.6
TOTAL	621	443	86	92	78.2

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by 2 and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent predictions have been verified, the reports from the agents at the "Probability Stations," as well as the telegraphic reports, are used.

The daily probabilities and storm warnings were issued by Probability Officer, H. V. Payne.

STORM WARNINGS.

During the month warnings on the approach of four storms were issued to our agents, and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 50, of which 28, or 56.0 per cent., were verified; 8 stations reported warnings received late, 6 owing to delay in issue and 2 owing to delay in transmission. Four stations reported storms for which no warnings were received.

In connection with the warnings, predictions as to the probable directions of the wind were given, and of the 28 warnings verified as to force, 16, or 57.1 per cent., were fully verified and 28 or 100 per cent. fully and partly verified.

(1.) At 10:42 a.m., 3rd, Signal No. 3, indicating a heavy easterly gale, was ordered for stations in Nova Scotia from Halifax east, a very severe storm being at that time situated off the New England Coast. At the stations warned, the blow was heaviest from the eastward during the evening and night of the 3rd, and was accompanied by snow and rain, but the gale continued with reduced violence during the 4th, after which the centre passed northward to the Gulf gradually dispersing. Reports from the Bay of Fundy show that a northeast gale and snowstorm prevailed there during the 2nd and 3rd. Signals were lowered during evening of the 4th.

(2.) At 10 p.m., 10th, owing to a developing storm centre in Vermont, Signal No. 2, indicating a moderate gale at first from a westerly direction, was ordered for stations in the Bay of Fundy and Nova Scotia, and No. 1, indicating a moderate gale at first from an easterly direction, for stations in Cape Breton. As the storm centre moved across the Province of Quebec during the

11th there was a moderate southwest to northwest gale in the Bay of Fundy, but at other points warned the force of the wind did not exceed a fresh to strong breeze. Signals were lowered on afternoon of 12th.

(3.) On the morning of the 18th there was a developing storm off the coast of Virginia and Carolina, and at 10 a.m., Signal No. 3, indicating a heavy gale at first from an easterly direction, was ordered for all our Atlantic ports open for navigation. As the storm moved northward an easterly gale with sleet and rain set in that evening in the Bay of Fundy and before next morning had extended to Cape Breton; during the 19th the storm centre passed with still increasing energy to the northern part of the Gulf and a southwesterly gale became general throughout the Maritime Provinces lasting until the early morning of the 20th. Safety telegrams were despatched at 10 p.m., 19th.

(4.) At 4 p.m., 27th, Signal No. 1, for a moderate east, veering to north and northwest gale, was ordered for all our ocean stations, there being then a developing depression near the middle Atlantic Coast. The depression moved very quickly eastward passing south of Nova Scotia and caused only fresh to strong winds at the stations warned. Signals were lowered during forenoon of 28th.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR MARCH, 1892

The month was remarkable for the large number of disturbances recorded, the magnets being seldom at rest. The disturbing power on the nights of the 6th and 12th was particularly active.

The month opened with the magnets in a slightly disturbed condition, during the afternoon the movements became more important, after 8 p.m. a quiet interval occurred, but a little before 10 p.m. the declination magnet took a sudden easterly sweep of 38° . The horizontal component being increased and the vertical showing a decrease. After 4 a.m. of the 2nd the disturbance became less active, but increased during the afternoon and night. After 2 a.m. of the 3rd the magnet came suddenly to rest. In the evening another disturbance appeared and continued until next morning and the following night. The 5th was a particularly quiet day. After 4 a.m. of the 6th a disturbance suddenly sprung up, the declination magnet taking a sharp easterly movement followed by a larger westerly swing. There were no large changes until the afternoon, and the storm was at its highest between 7 and 9 p.m. At 7.20 p.m. the declination began to move east and by 7.45 it had altered $1^\circ 29'$, a westerly swing then set in, the maximum reading taking place at 8.13 p.m. The change between 7.45 and 8.13 amounted to $2^\circ 1'$. After reaching its maximum it vibrated for about five minutes and an easterly movement of $1^\circ 22'$ was recorded in half an hour. After 9 p.m. the disturbance became less active. There were signs of increased activity after midnight lasting about an hour. At 4 a.m. the magnet was about its normal position and fairly steady. The force magnets at the commencement of this disturbance were suddenly increased, a slight decrease following. The horizontal force was more affected between 3 and 5 p.m., the intensity being greatest during those hours, and during the time the declination magnet was the most disturbed (between 7 and 9 p.m.) the horizontal component was not largely affected, the vertical component on the contrary changing rapidly.

Small disturbances were recorded on the 7th, 8th, 9th, 10th and 11th. At 5.17 p.m. of the latter day the three magnets were suddenly disturbed, the declination magnet took an easterly movement followed by a remarkably quick westerly swing and immediately afterwards an easterly. These were the sharpest changes recorded for some time. After 5.20 p.m. it moved gradually east and between 6 and 9 p.m. a pretty disturbance was recorded, the magnet taking several easterly and westerly swings of $1^\circ 10'$. After 3 a.m. of the 12th the activity increased considerably and at 4 a.m. the magnet moved west, the spot of light going off the paper; during the return swing some rapid oscillations occurred, and from 5 to noon the magnet was in constant vibration, the general tendency being eastward.

During the afternoon the magnet was considerably east of its mean position and moving in swings ranging from $5'$ to $30'$. A little before 8 p.m. the movements increased considerably, the magnet taking several rapid swings of over $1^\circ 45'$ in a short time. After 9 p.m. it gradually moved east: a short time before the midnight observation the disturbance died away. Both forces at the commencement of this disturbance were suddenly increased. About 7.10 p.m. a still further increase set in being decidedly marked on the horizontal force curve, the change being over

·0059 C G S in twelve minutes, the spot of light going off the paper. On its return the movement was rapid. About 8:12 another sharp decrease commenced, the force diminishing ·0048 C G S in eighteen minutes: after 8:30 the disturbance became very much less and the force gradually decreased until 2:40 a.m. of the 12th. About 3:30 a still further diminution began, the needle moving rapidly until 4 a.m. when a series of vibrations commenced, followed by a rapid decreasing swing, the minimum reading taking place at 4:13 a.m. A rapid recovery then set in, the magnet vibrating violently, some sharp oscillations were recorded between 6 and 8 a.m., the magnet keeping about its normal reading. The total change of horizontal force during this storm was over ·0141 C G S.

The v.f. maximum was recorded at 7:27 p.m. and the minimum at 4:09 a.m. of the 12th. The force for 7 hours previous to this decreased very rapidly. The total change of v.f. was ·01492 C G S. During the afternoon of the 12th both components of the force were changing rapidly, notably the h.f. which was quickly increased between 0:40 and 3:13 p.m. the v.f. though disturbed was not so much affected. From 7:43 to 8:20 rapid changes in both forces were going on. The 13th and 14th were comparatively quiet days. At 4:57 a.m. of the 15th one of those preliminary quick movements which generally precedes large storms was recorded, nothing of importance however followed, a slight disturbance being felt on the night. A quiet period set in on the 16th and continued until the night of the 23rd, when the curves became a little irregular. On the 24th, 25th and morning of the 26th disturbing action was recorded, being more marked on the nights of the 24th and 25th. On the night of the 26th disturbing action again appeared and continued to the end of the month. There were no movements of any magnitude recorded, still the magnets were decidedly disturbed.

Auroral light and arch was observed on the 1st. Faint auroral light on the 2nd. On the 6th auroral arch patches and faint streamers since 7 p.m.; at 10 and midnight faint auroral arch and patches in N. (class II). On the 12th, from 7:30 to 9 p.m. auroral arch, patches and short streamers. At 10 p.m. faint auroral light in N. (class III). On the 25th faint auroral light at midnight. On the 26th faint aurora and a few streamers in N. and N.N.W. On the 27th faint auroral arch. On the 28th faint auroral light, some streamers, 7:45 to 9:30 p.m. (class III). On the 29th and 31st faint auroral light. On the 5th, 7th, 13th, 14th, 15th, 16th, 19th, 20th, 21st and 30th the sky was clear but no aurora was observed: on all other nights, clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL,
Director.

METEOROLOGICAL OFFICE,
Toronto, 10th May, 1892.

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

APRIL, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years from Montreal westward, and was below the normal further east.

On the morning of the 1st there was an important cyclone in Nebraska, while an area of high pressure was over New England; the storm moved north and northeast, passing across Lake Superior and thence in a more easterly direction; at night it caused heavy rain in the Upper Lake Region; rain turning to snow in Manitoba and local showers in Ontario. During the 2nd strong southwest winds prevailed in the Lake Region, with fine warm weather, and to the eastward the weather was also fine, with temperatures generally between 50° and 60°.

The charts of the 3rd showed a cyclonic development in progress over the West and Southwest States, and by the morning of the 4th there was another important storm centre in Nebraska; like the preceding it moved to Lake Superior and the east, it caused a northerly storm and light snow in Manitoba, and in the Lower Lake Region rain which began on the evening of the 3rd, continued at intervals until the morning of the 5th, after which there was a southwesterly gale, and the temperature at many points rose above 70°. The 5th was a showery day along the St. Lawrence, and at night there were some local showers in the Maritime Provinces.

A developing anti-cyclone brought strong, cold northwesterly winds and snow flurries in the Northwest Territories on the 6th and in Manitoba on the 7th, then spreading eastward it gave very strong, cold northwesterly winds over the Lakes on the 8th following the development and eastward movement of a cyclone area, which had given heavy showers during the day. During the 9th and 10th the low pressure moved very slowly towards and over the Gulf, causing some light snow in Quebec and New Brunswick, after which strong westerly winds gradually set in.

The centre of the anti-cyclone moved with much persistency to the northward of the Upper Lakes, and cold northerly winds continued in Ontario and eastward. On the 10th a small depression moved into the Northwest Territories, there giving showery weather, followed next day by cold northerly winds and some snow. A cyclone of importance appeared over the Southwest States on the 12th, and thence passed eastward across the Ohio Valley, causing strong northeasterly winds, but no rain, in the Lake Region. After leaving the coast it moved south of Nova Scotia and gave only a few local rains in that Province.

A depression which appeared in British Columbia on the 14th caused southerly winds and warm springlike weather over the Northwest Territories for a day or so; it then moved south and southeast to the Missouri Valley and Texas, while anti-cyclonic conditions north of the Lakes and Manitoba not only continued, but became more pronounced and extended, causing a continuance of cool northwest winds from Ontario to Nova Scotia, and cool northeast to east winds in Manitoba and the Northwest, with fine weather generally prevalent. During the night of the 20th the depression moved very quickly in a northeasterly direction, and on the 21st caused showery weather in Ontario and on 22nd in Quebec and the Maritime Provinces.

On the 20th, 21st and 22nd, the weather was fine and warmer in Manitoba and the Northwest Territories, but by the morning of the 23rd a pronounced and rapid anti-cyclonic development had

occurred to the northward of Manitoba, and cold northerly winds, with falling temperature, were general from the Northwest Territories to the Upper Lakes. By night the northerly winds extended over the Lower Lake Region and St. Lawrence Valley, and from 10 to 30 degrees of frost were very generally recorded. For about three days the anti-cyclonic centre hovered over the Lake Region, while a cyclonic development was in progress over the Western States. By the night of the 26th there was an important storm centre in Nebraska, and a rapid increase of pressure was in progress in Alberta, where a northerly gale, at some points accompanied by snow, was blowing. The storm moved directly to Manitoba with increasing energy, and a northwesterly blizzard prevailed during the 27th in the Territories, while strong easterly winds, with rain, prevailed in Manitoba. During the early part of the 28th there was a furious north to northwest gale with heavy snow in Manitoba, accompanied by a very decided fall in temperature, and then for the last two days of the month the pressure was high and temperature abnormally low both in Manitoba and the Territories, and there were light snowfalls at many points.

Passing eastward across Canada on the 28th the storm gradually dispersed ; it gave strong southwesterly winds and warmer weather in the Lake Region during the day ; some heavy local showers at night in Quebec and a pretty general fall of rain next day in the Maritime Provinces.

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations was below the normal of eighteen years at all stations to the west of Montreal and above the normal at all stations further east.

The highest and lowest Temperatures in each Province during April were:

B. COLUMBIA, $77^{\circ}\cdot 0$ on 20th, at Agassiz ; $10^{\circ}\cdot 0$ on 4th and 7th, at Barkerville.

N. W. TERRITORIES, $70^{\circ}\cdot 8$ on 26th, at Medicine Hat ; $-3^{\circ}\cdot 0$ on 7th, at Saskatoon.

MANITOBA, $68^{\circ}\cdot 5$ on 26th, at St. Alban's ; $-14^{\circ}\cdot 0$ on 8th, at Portage la Prairie.

ONTARIO, $74^{\circ}\cdot 5$ on 5th, at Saugeen ; $-6^{\circ}\cdot 5$ on 10th, at Little Forks.

QUEBEC, $66^{\circ}\cdot 0$ on 21st, at St. Hyacinthe ; $0^{\circ}\cdot 8$ on 25th, at Father Point.

N. BRUNSWICK, $63^{\circ}\cdot 2$ on 3rd, at St. Andrew's ; $12^{\circ}\cdot 0$ on 1st, at Bathurst.

NOVA SCOTIA, $65^{\circ}\cdot 0$ on 24th, at Pictou ; $16^{\circ}\cdot 0$ on 1st, at Truro.

P. E. ISLAND, $64^{\circ}\cdot 0$ on 24th, at Georgetown ; $18^{\circ}\cdot 9$ on 25th, at Kilmahumnaig.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, APRIL, 1892.

[illegible]

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION, &c.—Continued.

PRESSURE IN INCHES.				TEMPERATURE OF AIR.										DIRECTION OF WIND FROM										VELOCITY OF WIND.				PRECIPITATION.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Mean actual.		Mean reduced.		Highest.		Lowest.		Range.		Mean.		Difference from average.		Years observ.		Highest.		Date.		Lowest.		Date.		Mean daily range.		Greatest daily range.		Mean temperature of dew-point.		Mean relative humidity.		Mean amount of cloud.		No. of days completely clouded.		N.		S. E.		S. W.		W.		N. W.		C.		Total number of hours.		Mean, miles per hour.		Highest days.		Date and direction.		Amount.		Difference from average.		No. of days.		No. of fair days.		No. of Auroras.		No. of Thunderstorms.		No. of Fogs.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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ONTARIO—Continued.

Novar.....	35.6	+ 0.1	5.64.3	5	11.0	25	24.7.47.2	5	2	9	5	0	5	2	12	7	15	30	85	11	4	2	0	
Little Forks.....	53.1	— 8.5	1.62.0	25	— 6.5	10	22.8.37.4	.....	93	4	47	13	5	1	2	8	12	2	0	90	11	9	2	0
Wainstead.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Francis.....	30.8	.....	57.1	23	0.0	10	17.6.37.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shannonville.....	41.3	— 2.1	3.67.0	5	21.0	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
QUEBEC:																									
Montreal.....	29.98	30.51	29.45	1.06	20.6	12	16.0.28.6	34.6	62	6	2	16	58	27	78	58	110	54	319	0	720	17.7	33.3	3 S.W.	
St. Hyacinthe.....	40.7	— 1.7	1.68.0	21	18.0	25	30.0.38.0	.....	6	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond.....	37.6	— 0.9	15.64.5	22	17.0	12	20.4.42.5	.....	5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicoutimi.....	34.6	— 0.6	15.59.9	22	7.0	25	19.3.13.6	.....	7	9	0	19	0	0	0	0	0	0	70	1	90	V	1X	11NW
Quebec.....	29.93	30.47	29.37	1.10	11.0	24	16.7.50.7	.....	5	5	5	5	1	0	2	4	25	9	9	60	35.0	35.0	35.0	6W
Lennoxville.....	38.7	— 2.1	2.64.8	21	12.5	1	20.4.41.4	.....	6	4	4	0	2	1	8	16	21	9	0	70	.....	.....	.....	3W
Brome.....	38.6	— 1.0	12.62.0	22	15.0	25	19.7.40.0	.....	4	5	13	0	2	1	8	16	21	9	0	70	.....	.....	.....	0.36
Father Point.....	34.9	— 2.1	18.53.1	28	0.8	25	14.6.36.1	.....	6	9	11	0	3	1	2	5	24	11	3	60	51.0	51.0	51.0	25W
Point des Monts.....	32.6	— 1.4	18.57.0	19	20.0	9	.....	.....	.....	.....	9	20	0	0	0	30	28	3	0	90	.....	.....	.....	1.50
Cape Chatte.....	35.3	— 2.1	8.48.0	22	20.0	24	.....	.....	.....	.....	1	4	5	0	1	12	44	7	16	90	.....	.....	.....	1.30
Blequet.....	37.7	— 3.0	8.45.0	21	20.0	24	.....	.....	.....	.....	0	9	2	0	1	13	24	24	5	78	.....	.....	.....	1.30
Cape Magdalene.....	35.3	— 2.7	9.49.0	22	18.0	24	.....	.....	.....	.....	1	7	2	1	12	1	3	54	9	90	.....	.....	.....	1.57
NEW BRUNSWICK:																									
Fredericton.....	29.85	30.39	29.26	1.13	18.9	25	20.4.37.2	26.7	55	4	6	3	30	3	5	31	0	12	3	3	90	9.1	17.7	12W	
Chatham.....	29.84	30.36	29.18	1.18	18.1	1	18.1.18.1	.....	5	3	3	1	6	2	1	18	16	4	9	60	.....	.....	.....	1.71
Bathurst.....	29.81	30.37	29.24	1.13	12.0	1	23.1.14.0	37.8	77	5	4	0	10	10	0	0	33	3	16	90	1	1V	11NW	1.43	
St. Andrews.....	40.5	— 2.1	18.63.2	3	19.8	25	0.0.27.7	.....	3	1	4	1	1	1	4	3	23	12	60	.....	.....	.....	1.27	
Grand Manan.....	29.88	30.43	29.24	1.19	24.8	25	15.3.23.0	.....	5	4	4	0	0	6	3	12	16	16	3	60	29.7	29.7	29.7	2SW
Point Lepreau.....	39.3	— 2.0	15.54.0	20	24.0	25	.....	.....	.....	4	5	14	2	2	5	11	27	0	78	0	10	6W	1.90	
St. John.....	40.7	— 1.8	8.60.2	20	21.2	25	16.7.27.7	30.2	66	4	3	5	5	1	14	26	50	10	180	6.0	11.0	11NW	2.15		
St. John (City).....	30.7	— 2.5	32.57.0	20	21.0	25	12.9	.....	87	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.2	15.3	11	1.97	
Dorchester.....	35.1	— 0.5	4.57.0	18	19.0	25	14.9.29.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.84	
Halifax.....	35.9	— 4.0	13.59.0	1	15.5	1	17.3.44.5	.....	.....	6	8	0	0	5	0	0	20	0	31	56	0	10	12W	2.26
Parker's Ridge.....	37.4	— 2.2	4.60.0	21	15.0	25	17.0.31.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.84	
NOVA SCOTIA:																									
Halifax.....	29.91	30.41	29.26	1.15	25.5	1	19.0.35.5	.....	5	5	5	3	0	6	0	10	14	19	3	66	.....	.....	.....	2.65
Yarmouth.....	29.84	30.34	29.23	1.11	21.1	1	16.7.29.6	30.3	72	5	1	12	8	1	9	19	69	20	12	180	10.2	20.2	7W	2.06	
Yarmouth.....	29.94	30.39	29.31	1.01	25.1	1	12.1.26.9	.....	5	7	12	0	1	4	4	19	12	3	60	.....	.....	.....	2.57	
Truro.....	40.6	— 2.7	18.67.3	6	16.0	1	22.0.38.5	.....	6	7	0	7	0	5	10	24	19	13	16	88	0	10	11SW	1.72
Pictou.....	41.1	— 3.8	14.65.0	24	21.0	1	17.6.34.0	.....	3	2	8	15	2	0	7	22	15	17	3	90	0	0	11W	1.39
Digby.....	42.5	— 3.3	9.62.0	21	27.0	1	.....	.....	.....	3	3	12	2	7	3	0	19	23	14	0	90	0	0	3.80
Whitehead.....	36.3	— 1.8	8.49.0	4	29.0	10	.....	.....	.....	.....	16	5	1	1	7	15	3	5	7	99	.....	.....	.....	2.29
Sable Island.....	40.6	— 2.8	8.50.5	9	32.0	11	.....	.....	.....	.....	6	4	0	6	6	22	16	24	6	90	.....	.....	.....	1.28
NEWFOUNDLAND:																									
St. John's.....	29.82	30.28	29.11	1.17	20.0	1	16.9.30.0	7	8	2	11	1	5	14	6	9	19	3	60	3.81
Bermuda.....	30.17	30.44	29.63	0.81	63.5	5	0	8	5	0	1	9	15	8	8	6	60	2.35
P. E. ISLAND:																									
Kilmahamag.....	38.6	— 4.0	13.61.5	21	18.9	25	19.6.44.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.62
Georgetown.....	41.4	— 5.6	8.64.0	24	23.0	1	15.6.26.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.81
Charlottetown.....	38.8	— 3.7	16.57.9	24	25.8	1	13.8.24.4	.....	.....	5	6	16	39	3	63	38	265	38	150	108	730	20.3	28SW	1.42
BRITISH COLUMBIA:																									
Esquimalt.....	29.98	30.50	29.27	1.23	30.0	7	13.4.28.8	44.0	91	6	5	38	11	0	0	16	45	1	38	31	180	9.0	18.7	10SW	2.53
Quamichan.....	46.1	— 3.5	5.72.0	20	29.0	11.18	23.8.42.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.09
Barkerville.....	28.8	— 5.4	4.52.0	21	10.0	4.7	21.2.35.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.26
Agassiz.....	46.3	— 2.3	2.77.0	20	30.0	7	16.7.36.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.26
Port Moody.....	46.0	— 2.9	3.71.0	20	29.0	6	16.8.31.0	4.59
Abbotsford.....	45.1	— 6.8	6.5.8	21	29.7	11	18.0.30.7	3.42
Nanaimo.....	29.96	30.38	29.28	1.00	23.0	8	24.6.40.0	32.1	55	6	1	0	1	16	1	5	8	11	0	30	75	4.9	12.0	26 E.	0.18
Spence's Bridge.....	48.4	— 4.7	3.74.0	20	23.0	8	24.6.40.0	32.1	55	6	1	0	1	16	1	5	8	11	0	30	75	4.9	12.0	26 E.	0.18

STATIONS NOT ENTERED IN MARCH REVIEW 1892.

PROVINCE.	STATION.	MEAN TEMP.	HIGHEST TEMPERATURE.		LOWEST TEMPERATURE.		PRECIPITATION.		AURORAS.	THUNDER STORMS.
			Temp.	Date.	Temp.	Date.	Amount.	Days.		
		°	°		°		in.			
N. W. Territory	Oonikup	16 33	51°0	30	-33°0	15	0 66	9		
	Regina	13 61	41°0	31	-31°0	15	0 73	5		
Manitoba	Portage la Prairie.....	21 52	49 0	27	-16°0	15	0 63	5	12, 17, 25, 27.	
	Channel Island.....	14 09	36 0	30	-30 0	13	0 23	3	9, 12, 13, 18, 21, 23, 24, 25, 26, 31.	
Quebec	Anticosti, S. W. P.	23 16	35°0	6	-5 0	2	4 60	8		
New Brunswick.....	Bathurst	27 70	59 0	31	-7°0	15	3 16	11	12.	

PRECIPITATION.

The rainfall throughout the Dominion has, with the exception of Quebec, been much below the average.

The general distribution is as follows :—

IN BRITISH COLUMBIA the rainfall was in general 2·92 in. In the interior little has fallen.

IN the NORTH-WEST TERRITORIES, 0·45, about one-half that of April, 1891.

IN MANITOBA the rainfall was 0·71 in., or 0·51 in. below the average.

IN ONTARIO, West and South-West District it was 1·60 in., or 0·36 in. below the average. In the North and North-West District it was 1·12 in., or 0·55 in. below the average. In the Central District it was 0·94 in., or 0·96 in. below the average. And in the East and North-East District it was 0·92 in., or 0·74 in. below the average.

IN QUEBEC it was 1·52 in., or 0·16 in. above the average.

IN NEW BRUNSWICK it was 1·37 in., or 0·65 in. below the average.

IN NOVA SCOTIA it was 2·17 in., or 0·22 in. below the average.

IN PRINCE EDWARD ISLAND it was 1·20 in. or 0·50 in. below the average.

Rainfall 5 in. and upwards during month :

Little Forks, Ont., 7·00 in.

Rainfall 1 inch and upwards in 24 hours :—

1. Fort Francis, 1·50 in.; Little Forks, 2·01 in.

2. Little Forks, 1·50 in.

4. Dealtown, 1·39 in.; Point des Monts, 1·50 in.

9. Dorchester, 1·05 in.

14. St. John, Nfld., 1·62 in.

23. Channel, 1·36 in.; Glastonbury, 1·00 in.; Digby, 1·00 in.; Dalhousie, 1·16 in.; Point des Monts, 1·70 in.; Bathurst, 1·00 in.

26. Little Forks, 2·00 in.

27. Fort Francis, 1·75 in.; Little Forks, 1·00 in.

28. Portage la Prairie, 1·51 in.

31. Port Hastings, 1·20 in.

SNOWFALL.

In Ontario the snowfall has in general fallen below the average, except in the North and North-West District. In the other provinces less than the average has fallen.

The distribution is as follows :—

BRITISH COLUMBIA.—On the whole about 3 in. has fallen.

IN N. W. TERRITORIES about 7·8 in. has fallen, or nearly double the average.

IN MANITOBA 10·6 in. has fallen, or about the average.

In the districts of ONTARIO the amount is 0·8 in., or 0·3 in. below the average ; 2·5 in., or 0·1 in. above the average ; 0·1 in., or 1·6 in. below the average ; 0·7 in., or 3·1 in. below the average.

IN QUEBEC 2·4 in., or 5·1 in. below the average.

In NEW BRUNSWICK 3·5 in., or 4·1 in. below the average.

In NOVA SCOTIA inappreciable or 7·6 in. below the average.

In P. E. ISLAND 0·2 in., or 10·4 in. below the average.

Snowfall 8 inches and upwards during month :—

BRITISH COLUMBIA—Barkerville, 11 in.

N. W. TERRITORIES—Wallace, 12 in. ; Glenboro, 16 in. ; Banff, 14 in.

MANITOBA—Posen, 20 in. ; Portage la Prairie, 16 in. ; Brandon, 10 in. ; St. Albans, 19 in. ; Beaver Creek, 11 in. ; Treherne, 16 in. ; Hartney, 14 in. ; Turtle Mountain, 12 in. ; Roseberry, 16 in. ; Rathwell, 13 in. ; Clandeboye, 20 in. ; Winnipeg, 11 in. ; Shoal Lake, 24 in. ; Belmont, 18 in. ; Norquay, 15 in. ; Fairburn, 19 in. ; Greenwood, 14 in. ; Morden, 11 in.

ONTARIO—Buda, 12 in. ; Savanne, 10 in. ; Thompson, 8 in.

QUEBEC—Point des Monts, 8 in.

Snowfall 5 in. and upwards in 24 hours :—

1. Rosebury, 6 in. ; Pembina Crossing, 6 in.
2. Oakbank, 6 in. ; Posen, 5 in. ; Morden, 6 in.
4. Anticosti, 9 in. ; Little Forks, 10 in.
5. Anticosti, 9 in.
6. Banff, 6 in.
9. Wyoming, 6 in. ; Calvin, 5 in.
10. Point des Monts, 8 in.
11. Cape Magdalen, 6 in. ; Shoal Lake, 6 in.
12. Posen, 5 in.
19. Anticosti, 7 in.
22. Thompson, 6 in.
24. Anticosti, 11 in.
26. Glenbow, 12 in. ; Roseberry, 10 in.
27. Posen, 6 in. ; St. Albans, 14 in. ; Beaver Creek, 11 in. ; Treherne, 12 in. ; Turtle Mountain, 12 in. ; Rathwell, 7 in. ; Clandeboye, 9 in. ; Winnipeg, 6 in. ; Shoal Lake, 10 in. ; Fairburn, 16 in. ; Foxton, 5 in. ; Greenwood, 7 in.
28. Portage la Prairie, 8 in. ; Brandon, 6 in. ; Hartney, 10 in. ; Belmont, 13 in. ; Norquay, 10 in.
30. Oakbank, 10 in. ; Buda, 6 in. ; Savanne, 6 in. ; Shoal Lake, 7 in.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1. Sydney, IV. ; Prince Albert, III.
2. Sydney, III.
6. Hillview.
8. Prince Albert, II.
11. Alexandria, IV. ; Sydney, III.
13. Kingston, IV.
14. Hillview, Dorchester, III. ; Truro, IV.
15. Savanne.
16. Elora.
17. Oakbank, I. ; Savanne.
19. Little Forks, IV. ; Port Arthur, II.
20. Little Forks, IV.
22. Cartier, Peterborough, I. ; Durham, IV.
23. Stony Creek, IV. ; Gravenhurst, IV. ; Birnam, III. ; Oakbank, III. ; Chicoutimi, IV. ; Savanne, Egremont, Posen, II. ; Point Clark, II. ; Zurich, Kingsville, IV. ; Sombra, III. ; Dorchester, Ridgetown, Peterborough, III. ; Brantford, III. ; Lucknow, Elora, Georgetown, IV. ; Bognor, III. ; Sharon, II. ; Henrietta, III. ; St. Albans, II. ; Richmond, Russell, Winnipeg, III. ; Pembina Crossing, I. ; Barrie, Lennoxville, III. ; Alexandria, II. ; Lindsay, IV. ; Fredericton, Sydney, III. ; Quebec, IV. ; Prince Albert, I. ; Lennoxville, III. ; Toronto, III.
24. Bancroft, IV. ; Gravenhurst, IV. ; Birnam, IV. ; Novar, IV. ; Savanne, Egremont, IV. ; Posen, IV. ; Zurich, Kingsville, IV. ; Sombra, III. ; Dorchester, Joly, Georgetown, P.E.I., Haliburton,

IV.; Elora, Georgetown, IV.; Bognor, IV.; Sharon, I.; Parker's Ridge, Richmond, Pembina Crossing, II.; Truro, III.; Lennoxville, IV.; Alexandria, III.; Lindsay, IV.; London, Halifax, IV.; Woodstock, Fredericton, Kingston, IV.; St. Andrew, IV.; Quebec, IV.; Grand Manan, IV.; Lennoxville, IV.; Toronto, IV.; Wallace.

25. Bancroft, IV.; Stony Creek, II.; Gravenhurst, IV.; Birnam, IV.; Novar, I.; Hillview, Savanne, Egremont, III.; Pictou, Whiteside, Zurich, Kingsville, IV.; Sombra, IV.; Dorchester, Clontarf, III.; Joly, Ridgetown, Georgetown, P.E.I., Haliburton, II.; Brantford, III.; Kilmahumraig, Lucknow, Welland, Mattawa, Elora, Burk's Falls, Georgetown, IV.; Cayuga, III.; Midland, Calvin, Bognor, IV.; Sharon, IV.; Parkers Ridge, Richmond, IV.; Winnipeg, III.; Pelee Island, Truro, III.; Coldwater, IV.; Durham, II.; Lennoxville, II.; Alexandria, I.; Lindsay, IV.; Deseronto, London, Halifax, II.; Woodstock, Fredericton, Sydney, III.; St. John, I.; Parry Sound, I.; Kingston, I.; Port Stanley, III.; Father Point, IV.; St. Andrews, IV.; Quebec, IV.; Halifax, IV.; Lennoxville, II.; Toronto, I.; Montreal, III.
26. Bancroft, I.; Gravenhurst, IV.; Birnam, I.; Novar, III.; Chicoutimi, III.; Cape Chatte, *brigh'*; Egremont, IV.; Point Clark, II.; St. Hyacinthe, Pictou, Whiteside, Zurich, Dorchester.
27. Birnam, IV.; Pictou, Dorchester, Huntsville, II.; Parkers Ridge, Truro, IV.; Durham, II.; Bathurst, I.; Quebec, III.; Prince Albert, IV.
28. Bancroft, IV.; Novar, IV.; Hillview, Calvin, Russell, Durham, IV.; Lennoxville, IV.; Alexandria, I.; Deseronto, II.; Prince Albert, II.; Lennoxville, IV.
29. Bancroft, II.; Gravenhurst, IV.; Birnam, IV.; Egremont, II.; Saskatoon, I.; Sombra, IV.; Dorchester, Ridgetown, Lucknow, Elora, Georgetown, III.; Bognor, IV.; Sharon, II.; Winnipeg, I.; Alexandria, I.; Ottawa, IV.; Deseronto, III.; Kingston, IV.; Quebec, IV.; Prince Albert, II.; Toronto, IV.; Wallace.
30. Gravenhurst, IV.; Chicoutimi, IV.; Hillview, Egremont, IV.; Georgetown, P.E.I.; Georgetown, Ont., IV.; Henrietta, I.; Richmond, Russell, Truro, III.; Lennoxville, IV.; Alexandria, II.; Ottawa, IV.; Fredericton, Port Arthur, II.; Kingston, III.; Father Point, III.; Quebec, II.; Prince Albert, I.; Lennoxville, IV.; Toronto, III.; Halifax, IV.

Thunder recorded on the following dates :—

April, 1st.—Thompson.

April, 2nd.—Pelee Island, Dealtown, Wyoming,

April, 3rd.—Pelee Island.

April, 4th.—Durham, Toronto, Montreal, Petrolia, Paris, Pelee Island, Sharon, Midland, Thedford, Dealtown, Lion's Head, Georgetown, St. Thomas, Sprucedale, Sombra, Kingsville, Zurich, Egremont, Birnam, Cottam.

April, 5th.—Richmond, Paris, Bognor, Shannonville, Calvin, Warton, Presque Isle, Thompson, Cayuga, Burk's Falls, Barrie, Axe Lake, Peterborough, Haliburton, St. Mary's, St. Hyacinthe, Durham, Alexandria, Ottawa, Deseronto, Bathurst, Mount Forest, Chicoutimi, Novar, Stoney Creek, Brome, Coldwater.

April, 7th.—Calvin, Bancroft.

April, 23rd.—Alexandria.

April, 27th.—Sharon, Bognor, Beatrice, Calvin, Presque Isle, Burk's Falls, Uplands, Sprucedale, Owen Sound, Sombra, Zurich, Novar, Stoney Creek, Coldwater, Petrolia.

April, 28th.—Pelee Island, Bognor, Coldstream, Wilton Grove, Thedford, Thompson, Cayuga, Wyoming, Georgetown, St. Thomas, Haliburton, Ridgetown, St. Mary's, Zurich, Birnam, Bancroft, Lindsay, London, Petrolia.

Appearance of Spring Birds, &c.

ROBINS.—Bathurst, 10th; Lennoxville, 1st; Savanne, 14th; Thompson, 2nd; Beatrice, 1st; Paris, 1st; Peterborough, 2nd; Posen, 11th; Kilmahumraig, 17th; Banff, 14th; Portage la Prairie, 17th; Burks Falls, 3rd.

BLACK BIRDS.—Lennoxville, 1st; Sharon, 1st; Paris, 5th; Peterborough, 4th; Posen, 15th; Oak Bank, 29th; Georgetown, 1st; Burk's Falls, 14th; Toronto, 1st.

BLUE BIRDS.—Lucknow, 2nd; Kilmahumraig, 16th.

GEESE.—Savanne, 26th; Thompson, 15th; Egremont, 8th; Posen, 2nd; Calvin, 27th; Denbigh, 2nd.

HIGHHOLDER.—De Cewsville, 12th.

SWALLOWS.—De Cewsville, 22nd; Lucknow, 30th; Bancroft, 27th; Birnam, 27th; Cottam, 2nd; Zurich, 27th; Kingsville, 7th; Sombra, 30th; Ridgetown, 4th; Peterborough, 1st; Egremont, 28th; Wiarton, 26th; Cayuga, 21st; Toronto, 23rd; Calvin, 28th.

MEADOW LARKS.—Bognor, 4th; Portage la Prairie, 18th.

HUMMING BIRDS.—Quamichan, 9th.

FROGS.—Sharon, 7th; Bognor, 2nd; Beatrice, 20th; Collingwood, 4th; Bancroft, 19th; Clontarf, 20th; Haliburton, 19th; Brantford, 3rd; Egremont, 2nd; Posen, 13th; Owen Sound, 2nd; Kilmahumag, 15th; Portage la Prairie, 19th; Calvin, 21st; Orillia, 5th; Georgetown, 3rd; Scarborough, 4th; Toronto, 5th.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF APRIL, 1892.

	HOURS ENDING															
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.
ESQUIMAULT.....		0 00	0 07	0 37	0 43	0 52	0 52	0 53	0 55	0 55	0 61	0 47	0 42	0 24	0 00	..
AGASSIZ, E.C.....			08	08	20	27	34	37	37	34	18	20	16	08		
BRANDON.....		07	21	40	54	57	57	59	61	60	62	51	31	11	07	..
INDIAN HEAD.....			12	19	35	49	46	47	47	42	44	41	28	22	8.	..
WINNIPEG.....		31	58	59	62	70	70	71	68	64	60	63	60	55	19	..
KINGSVILLE.....		8.	28	45	61	64	58	62	59	60	56	47	40	21	8.	..
WOODSTOCK.....		8.	26	49	58	58	62	65	68	57	50	43	37	08		..
TORONTO.....		06	46	61	73	69	67	69	71	71	63	57	47	41	15	..
LINDSAY.....		18	53	75	60	14	66	65	61	68	67	59	54	52	60	8.
BARRIE.....		20	51	60	64	64	61	66	68	72	67	60	56	48	60	..
KINGSTON.....		20	51	62	60	62	64	65	63	60	60	55	48	36	8.	..
MONTREAL.....		06	40	54	60	61	69	67	65	65	57	50	47	46	19	..
FREDERICTON.....		01	41	55	60	61	67	69	62	63	67	62	60	48	28	..
SYDNEY.....		21	51	60	63	64	53	51	59	57	53	46	48	37	11	..
MEAN PROPORTION FOR MONTH.....	0 38	0 19	0 42	0 51	0 50	0 45	0 43	0 43	0 55	0 58	0 56	0 52	0 57	0 54	0 50	
<i>(Constant sunshine being 1.)</i>																
MAXIMUM DAILY AMOUNT.....	0 86	0 83	0 94	0 85	0 93	0 87	0 85	0 90	0 99	0 91	0 93	0 99	0 95	1 00		
DATE.....	18	20	23	22	9	25	26	17	13, 16	25	24	20	27	21		
NO. OF DAYS COMPLETELY CLOUDED.....	3	8	7	8	3	1	1	8	3	2	3	6	5	2		

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 604. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
MANITOBA.....	93	74	11	8	85.5
LOWER LAKE REGION.....	113	90	11	12	84.5
UPPER ST. LAWRENCE.....	101	89	9	3	92.6
LOWER ST. LAWRENCE.....	100	88	7	5	91.5
GULF.....	99	90	6	3	93.9
MARITIME PROVINCES.....	98	83	14	1	91.8
TOTAL.....	604	574	58	32	89.9

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions the reports from the agents at the "Probability Stations," as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer R. F. Stupart.

STORM WARNINGS.

During the month warnings on the approach of four storms were issued to our agents, and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 72, of which 58, or 80.5 per cent., were verified. At 12 stations, however, the force did not reach, and at 7 exceeded, that indicated by the signals displayed.

In connection with the warnings, predictions as to the probable directions of the wind were given, and of the 58 warnings verified as to force, 58, or 100 per cent., were fully verified.

1. At 10.30 a.m. on the 5th, Signal No. 4 for a heavy westerly gale was ordered for Lake Ontario stations, and 3.50 p.m. on the afternoon of the same day Gulf and Ocean stations were warned for a moderate westerly gale. The disturbance for which these Signals were displayed travelled over the Lake Region and down the St. Lawrence Valley to the Gulf. At first it was very important and caused a fresh westerly gale over the Lake Region during the 5th, but afterwards it became of much less energy, and no storm was experienced in the Maritime Provinces. Signals were lowered at 10.25 a.m. on the 6th.

2. At 10.22 p.m. on the 13th Lake Ontario stations east to Cobourg were warned for a moderate easterly gale, and on the 14th a moderate storm from the direction indicated prevailed generally at the stations notified. Signals were lowered on the evening of the 14th.

3. The Georgian Bay and Lake Huron stations were warned for a moderate northerly gale at 10.50 a.m. on the 23rd in advance of an important high pressure area which was moving down from the northward. During the evening and night of the 23rd a northerly storm was experienced over the districts notified. Presqu'Isle reports 40 miles an hour, Goderich 50 miles an hour and Kincardine 30 miles an hour. Signals were lowered at 9 a.m. on the 24th.

4. At 10.10 p.m. on the 26th Lake Superior was warned for a heavy easterly gale, the following morning the Georgian Bay and Lake Huron for a moderate S. to S.W. storm, and on the night of the 27th, at 10.05 p.m., Lakes Erie and Ontario were notified to expect a heavy S.W. to N.W. gale, and at the same time Signal No. 4 was substituted for No. 3 on Lake Superior. An area of low pressure which was centred in the West Southwest States on the 26th travelled thence to Lake Superior and over the Lake Region to the St. Lawrence Valley, where its energy became unimportant. Throughout the Lake Region it caused a gale from the directions indicated during the 28th, which in many places was quite heavy. Port Arthur and Sault Ste. Marie report a heavy westerly gale. Presqu'Isle and Port Hope 50 miles an hour; Goderich, S.W. 34 miles; Pelee Island, S.W. 30 miles; and Saugeen and Toronto, S.W. 42 miles. Signals were lowered at 10.10 p.m. on the 28th.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR APRIL, 1892.

Slight disturbances prevailed for the first three days, also during the night of the 6th, and morning of the 8th. On the following morning a moderate disturbance commenced, the most important movements taking place between 3 and 5 a.m., an increase of westerly declination and a decrease of both forces, being recorded. On the following morning the magnets were disturbed. From the 11th to the 14th, slight irregularities were recorded. After 9 p.m. of the 14th, a quiet period began and remained exceptionally steady until the evening of the 23rd, when a slight disturbance began and continued to the afternoon of the 25th, when the disturbance became more pronounced, a little before 10 p.m. there was an easterly swing of declination of 45', after 11 p.m. the movements increased considerably, and during the morning hours one of the most active storms since the 13th of February was recorded. Between 11.55 p.m. and 0.3 a.m. of the 26th, the declination magnet moved east 1° 30' this was followed by a westerly swing of 1° 40' in about twenty minutes. After 2 a.m. rapid vibrations commenced, the magnet moving west, the maximum reading being recorded at 6.51 a.m. of the 26th, 40' west of the normal. The greatest easterly limit was recorded at 0.3 a.m., 57' east of the normal, and the total range of declination was 1° 37'. A little after 7 p.m. of the 25th, both forces were considerably increased, principally the horizontal component, a rapid diminution immediately following. The force keeping on diminishing until midnight,

when a slight recovery occurred, lasting for a short time. All morning both components were below their respective normals, and the needles were oscillating rapidly. The total change of h. f. was .00111 c. g. s. During the afternoon the storm abated considerably, but an increased activity set in again during the night hours, when some quick changes were recorded. On the morning of the 27th the disturbance passed off. On the 29th a slight disturbance occurred, the 30th was a comparatively steady day until midnight when another heavy storm began.

On the 23rd auroral arch and short streamers were observed, and on the following night auroral light 8 to 9.30 p.m. And on the 25th at 10 p.m. auroral arch in N. at 10 p.m., but no active features. After 10 p.m. a very fine band of light in N. and N. E. Fine clumps of streamers and patches of yellow colour passing freely. After midnight the display burst into rapid motion, waves of vapour flashing in a continuous stream mingled with fine spindles to south of zenith. About 12.35 an imperfect corona was formed, after this it abated in activity, but remained very bright to south of east.

On the 26th auroral arch and faint streamers since 8.20 p.m., at midnight diffused auroral light and a few bright patches in N. On the 29th faint auroral light, class IV, and on the 30th, class III. On the 2nd, 5th, 6th, 7th, 8th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, and 20th, it was possible to see aurora. On all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL,

Director.

METEOROLOGICAL OFFICE,

TORONTO, June 11th, 1892.

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

MAY, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years from White River westward, and was below the normal with a few trifling exceptions at all stations east of Saugeen.

Ten low pressure areas passed over the continent during the month, the most important of the number, and particularly so, on account of its erratic movement, occurred between the 17th and 24th. The month was remarkable for the very wet weather which nearly everywhere prevailed, as well as for the fall of snow over the Northwest Territories and Manitoba on the 29th.

The morning of the 1st opened with high pressure, covering the eastern portion of the continent and the Northwest States and Territories, and with an elongated trough of low pressure stretching from Texas to the Upper Lake Region. The weather was unsettled and showery in the Lake Region, and generally fair and cool elsewhere, with heavy frosts in Manitoba and the Territories.

The showery weather extended along the St. Lawrence and to the Maritime Provinces during the 1st, snow or sleet falling at night in some parts of Quebec, and until the night of the 3rd in Ontario, and until the following night in Eastern Canada rain fell frequently and heavily. Light falls of snow or rain were also very general in the Northwest from the 1st until the 3rd. On the 4th strong westerly winds were experienced in the Lake and St. Lawrence districts, attaining to the force of a moderate gale in some portions of the Gulf of St. Lawrence.

The advance of a shallow depression from the Southwest States caused it to be unsettled and showery in Ontario on the 5th and 6th. There were also some showers of rain or sleet in the St. Lawrence and the Maritime Provinces on the 7th and 8th. The movement at the same time of an anti-cyclonic system into the Northwest Territories and Manitoba was attended there by a continuance of cold weather as well as by a fall of snow in nearly all localities. The anti-cyclone spread gradually to the Atlantic, drawing at first strong and cool northerly winds over the greater portion of the country; eventually during its presence the weather was fine in Ontario from the 7th until the 9th, and on the 9th and 10th in Eastern Canada.

An area of low pressure which in the first place had travelled over the Southwest States, passed into the Lake Region on the 10th, and off our Atlantic Coast by the night of the 12th. It caused heavy rains throughout its course, and at the same time rain or sleet also occurred in Manitoba and the Territories.

The 13th and 14th were generally fine days throughout the country, the pressure being above its average in nearly all localities.

The passage of a depression from the Southwest States over the Lake Region and the St. Lawrence Valley to the Atlantic, gave showery weather in Ontario on the 15th, and in Eastern Canada on the 16th. It was succeeded by fine weather and higher pressure in the former Province on the 16th and 17th, and in Quebec and the Maritime Provinces on the 17th and 18th.

In the Northwest Territories and Manitoba, the pressure was below its average from the 15th until the 19th, and there were showers or heavy thunderstorms during the time in nearly all places.

A very unsettled period occurred from the lakes in the Atlantic, from the 18th until the end of the month. In the first place an important low area travelled from the Southwest States to Lake Michigan. After hovering there all day on the 19th, its centre receded into Wisconsin, afterwards as a shallow depression it hovered a little to the southward of the Lower Lake Region until the 23rd, when, with renewed energy, it passed to the Lower St. Lawrence Valley where it finally remained, gradually dispersing. On the 24th a shallow depression moved into the Upper Lake Region, and again on the 29th, after a slight recovery of pressure, another low area of more importance than the one on the 24th traversed the Lakes and Eastern Canada. The weather of this protracted interval from the Lakes to the Atlantic was most unsettled and showery, and the rainfalls at times were exceptionally locally heavy. There were only two days during the period when rain did not fall in some portions of Ontario, namely, the 27th and 28th and only one day in Quebec, the 28th. While the first low area was approaching, which was the most important and erratic of the series, a heavy easterly gale was experienced during the night of the 18th and on the 19th over the Lower Lake Region. On the 23rd also, strong winds or moderate gales from the eastward were experienced in Quebec, as well as at the same time, strong easterly winds over the Maritime Provinces.

In the Northwest Territories and Manitoba, from the 19th until the 21st the pressure was generally much above the average, and the weather was fine with local frosts at night, the pressure conditions were afterwards almost entirely cyclonic, the disturbance which prevailed between the 26th and 29th, being one of considerable importance. The weather as a rule was very unsettled, cool and showery, and some heavy local thunderstorms were experienced on the 29th also, snow fell to the depth of several inches in nearly all localities, succeeded the same night by heavy frosts. Strong winds and gales were of frequent occurrence more especially on the 26th and three succeeding days.

TEMPERATURE.

The average temperature has in general been below the normal throughout the Dominion, the largest difference in defect occurring in Manitoba and the Northwest Territories.

The highest and lowest Temperatures in each Province during May were:

B. COLUMBIA, 90°·0 on 20th, at Agassiz ; 29°·0 on 2nd, at Quamichan.

N. W. TERRITORIES, 85°·0 on 22nd, at Indian Head ; 5°·0 on 1st, at Wallace.

MANITOBA, 80°·5 on 16th, at St. Alban's ; 9°·0 on 4th, at Channel Island.

ONTARIO, 89°·0 on 31st, at Welland and Niagara Falls S. ; 19°·3 on 1st, at Guelph.

QUEBEC, 85°·7 on 31st, at St. Hyacinthe ; 19°·4 on 1st, at Richmond.

N. BRUNSWICK, 74°·4 on 29th, at Chatham ; 21°·0 on 4th, at Dalhousie.

NOVA SCOTIA, 71°·8 on 29th, at Truro ; 23°·3 on 11th, at Truro.

P. E. ISLAND, 70°·7 on 26th, at Kilmahumaig ; 18°·8 on 8th, at Kilmahumaig.

	PRESSURE IN INCHES.				TEMPERATURE OF AIR.				TEMPERATURE OF HUMIDITY.				DIRECTION OF WIND FROM.				VELOCITY OF WIND.				PRECIPITATION.													
	Mean actual.	Mean reduced.	Lowest.	Range.	Mean.	Diff. from aver- age.	Years observ.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Greatest daily range.	Mean relative humidity.	Mean amount of cloud.	No. of days completely clouded.	N. E. S. W. W. N. C.				Total number of hours.	Mean miles per hour.	Highest days velocity.	Date and direc- tion.	Amount. in.	Diff. from aver- age.	No. of fair days.	No. of Auroras.	No. of Thunderstorms.	No. of Fogs.				
																	N.	N. E.	S. E.	S. W.											W.	N. W.	C.	
N. W. TERRITORIES:																																		
Medicine Hat.....	29.93 30.46 29.30 1.16	48.4	46.8	1.6	48.4	7.3	88.1	4	21	16.9	1	23.8 40.7	1	23.8 40.7	1	23.8 40.7	4	5	12	1	10	4	8	9	9	62	1.03	-0.13	21	10	1	0	0	
Edmonton.....	29.97 30.40 29.46 0.94	46.8	46.8	0	46.8	3.5	97.8	0	21	18.0	1	22.9 37.0	1	22.9 37.0	1	22.9 37.0	1	2	6	12	2	1	4	20	15	62	0.19	-1.30	8	23	0	0	0	
Battleford.....	30.00 30.49 29.25 1.24	43.3	43.3	0	43.3	3.8	57.6	2	23	16.9	1	22.5 38.4	1	22.5 38.4	1	22.5 38.4	3	2	11	16	3	1	4	13	9	62	0.71	-1.14	0	0	0	0		
Prince Albert.....	30.04 30.57 29.32 1.25	43.1	43.1	0	43.1	3.8	67.7	4	26	20.4	2	22.0 38.4	2	22.0 38.4	2	22.0 38.4	6	3	10	2	1	2	8	8	23	62	1.49	-0.37	14	17	3	0	0	
Swift Current.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	6	8	3	12	4	6	4	10	9	62	3.16	1.65	18	13	0	0	0
Qu'Appelle.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Indian Head.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Wallace.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Regina.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Saskatoon.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Calgary.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Chaplin.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Henrietta.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Banff.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Okotuk.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Glen Adelaide.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
Maple Creek.....	30.03 30.46 29.22 1.24	43.0	43.0	0	43.0	6.7	82.5	22	16.8	1	22.0 38.4	1	22.0 38.4	1	22.0 38.4	1	3	4	10	10	7	4	7	14	3	62	1.43	-0.09	14	17	0	0	0	
MANTOBA :																																		
Minnetonka.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Winipeg.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Dauphin.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Hillview.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Elkhorn.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Russell.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
St. Albans.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Fort Osborne.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Oak Bank.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Fort Ellice.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Posen.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Brandon.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Channel Island.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
ONTARIO :																																		
Buda.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Savanne.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Heron Bay.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Chapleau.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2	3	7	14	5	62	1.38	-0.02	16	15	0	0	0		
Ignace.....	29.97 30.48 29.08 1.40	43.4	43.4	0	43.4	4.6	97.5	16	24.0	1	22.9 43.3	1	22.9 43.3	1	22.9 43.3	1	4	10	11	2</														

PRESSURE. TEMPERATURE. WIND AND PRECIPITATION, &c.—Continued.

[illegible]

ONTARIO—Concluded.

ONTARIO—Continued.	Novar.....	48-6	— 2-0	5-81-5	31	29-2	9	25-6 47-6	7	10	4	17	2	9	4	6	4	3	44	93	II	IV	7 N	2-48	— 0-17	13-18	2	2	1
	Fort Francis.....	42-9	72-0	18	23-0	8	14-1 34-1	6-01	—	17-14	1	0	0	
	Waukegan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Little Forks.....	46-4	— 10-1	1-68-0	24	29-0	7	18-8 34-0	43-5 93	5	6	26	1	3	5	15	5	24	14	0	93	II	III	29 W	7-00	+3-05	8-23	2	0	0
	Shannonville.....	52-7	— 1-1	3-82-0	31	41-0	7	2-74	+1-09	6-25	0	0	0	
QUEBEC:																														
	Montreal.....	52-9	— 1-4	18-81-2	31	34-0	16	18-0 28-2	41-8 65	6	5	125	127	50	52	76	47	113	152	2	744	15-3	29-8	4 N	2-20	— 0-57	15-16	4	0	2
	Anticosti, S. W. P.....	39-6	— 0-11	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	St. Hyacinthe.....	53-7	— 0-7	1-85-0	31	25-0	1	23-3 34-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Richmond.....	51-9	— 1-5	15-85-7	31	19-4	1	23-3 39-5	.....	4	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Chicoutimi.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Quebec.....	48-6	— 0-9	18-76-0	30	53-8	1	18-5 33-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Lennoxville.....	51-3	— 2-7	2-81-0	31	27-7	11	21-3 37-9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Brome.....	53-6	— 0-2	12-80-0	31	22-0	1	20-0 31-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Father Point.....	43-4	— 0-2	18-60-9	27	24-8	13	17-9 30-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Point des Monts.....	44-0	— 1-1	9-60-0	29	30-0	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Cape Chatte.....	42-7	— 0-3	9-65-0	27	27-0	1-6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bicquet.....	41-3	— 1-3	9-55-0	21	27-0	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Cape Magdalene.....	41-7	— 1-2	9-58-0	30	28-0	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NEW BRUNSWICK:																														
	Fredericton.....	49-1	— 2-0	19-74-0	26	24-4	1	19-9 31-8	39-8 68	6	7	2	12	25	8	7	13	15	8	3	93	9-0	19-9	6 W	2-44	— 1-77	22-3	1	0	4
	Charlottetown.....	46-8	— 1-5	18-74-4	29	26-1	1	18-6 31-4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bathurst.....	49-2	— 0-2	19-71-0	26	25-0	1	21-2 38-0	44-6 82	5	8	0	9	39	4	0	19	2	6	14	93	II	V	5 NW	2-18	— 0-43	11-26	0	0	0
	St. Andrews.....	47-2	— 1-3	18-65-7	14	32-0	6	18-4 30-7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Grand Manan.....	46-6	— 1-2	8-68-6	17	28-0	1	13-4 21-6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Point Lepreau.....	44-6	— 0-1	13-58-0	17	36-0	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	St. John.....	46-9	— 1-6	8-69-0	17	27-7	1	14-8 26-5	40-3 78	7	9	14	39	3	18	42	29	2	35	4	186	6-5	16-0	5 NW	3-46	— 0-54	16-15	1	0	0
	St. John (City).....	46-3	— 0-4	32-67-0	17	28-0	1	11-6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Dorchester.....	40-0	— 8-0	4-62-0	27	21-0	11	6-24-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Dalhousie.....	45-1	— 0-4	20-71-0	26	22-0	1	19-4 35-5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Parkville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NOVA SCOTIA:																														
	Halifax.....	46-3	— 2-0	19-70-8	29	29-5	1	15-5 27-3	40-9 79	7	7	35	23	37	5	43	45	21	10	29	248	6-1	12-6	8 N	5-46	— 0-71	21-10	0	0	0
	Sydney.....	42-5	— 2-3	22-69-5	15	26-3	2-4	11-9 22-5	37-8 79	7	3	41	6	12	15	21	40	14	12	22	186	8-7	22-3	9 N	5-33	— 1-07	17-14	3	0	1
	Yarmouth.....	46-6	— 1-1	12-63-3	29	31-3	10	12-6 21-6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Truro.....	46-9	— 2-0	19-71-8	29	23-3	11	17-6 41-5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Pictou.....	46-8	— 1-2	14-72-0	26	29-0	1	14-9 39-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Digby.....	48-5	— 1-4	13-69-0	27	38-0	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Whitehead.....	40-7	— 1-4	8-52-0	21	29-5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Sable Island.....	45-5	— 0-8	7-59-5	27	34-5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NEWFOUNDLAND:																														
	St. John's.....	39-7	— 3-5	20-73-0	27	25-0	3	16-0 35-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bermuda.....	68-2	.....	.....	.....	57-4	2	10-9 18-5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
P. E. ISLAND:																														
	Kilmarnock.....	45-1	— 1-5	13-70-7	26	18-1	8	17-5 37-2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Georgetown.....	46-4	— 1-9	3-70-0	26	31-9	11	13-4 36-3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Charlottetown.....	45-0	— 1-8	16-66-0	25	29-7	1	11-8 21-5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
BRITISH COLUMBIA:																														
	Esquimalt.....	52-4	— 0-2	1-69-6	19	27-9	3	15-3 29-5	50-1 92	6	5	38	1	0	1	0	8	7	90	32	186	8-6	20-2	29 S	1-95	+1-16	16-15	4	0	0
	Quamichan.....	54-5	— 1-6	5-84-0	20	29-0	2	20-3 49-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Barkerville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Agassiz.....	54-3	— 3-5	2-90-0	20	37-0	6	19-2 39-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Port Moody.....	53-8	— 2-4	3-85-0	20	35-0	1-5	19-6 33-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Abbotsford.....	62-1	.....	.....	.....	39-0	2-1	18-4 29-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Griffin Lake.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

STATIONS RECEIVED TOO LATE FOR THE APRIL REVIEW.

PROVINCE.	STATION.	HIGHEST TEMPERATURE.			LOWEST TEMPERATURE.		PRECIPITATION.		AURORAS.	THUNDER STORMS.
		MEAN TEMP.	Temp.	Date.	Temp.	Date.	Amount.	Days.		
		°	°		°		in.			
British Columbia	Griffin Lake	51.8	83.0	22	33.0	2	1.42	5		
N. W. Territories	Oonikup	26.2	62.0	21	-11.0	8	1.21	9		
	Regina	31.5	63.5	22	3.0	8	2.28	12		
Manitoba	Channel Island	24.3	45.0	25	-11.0	9	0.21	6	14, 15, 17, 19, 23, 30.	
Quebec	Anticosti, W. P.	33.4	45.0	28	30.0	5-12	1.78	7		

PRECIPITATION.

The rainfall throughout the Dominion has exceeded the average except in New Brunswick and the Prairie Provinces, the excess being greatest in the S. and S.W. district of Ontario, the amount at some stations being unprecedented.

The general distribution is as follows :—

In BRITISH COLUMBIA the rainfall was in general 3.10 in., or about 1.54 above the average.

In the NORTH-WEST TERRITORIES, 0.93, about 1.50 in. above the average.

In MANITOBA the rainfall was 1.44 in., or 1.01 in. below the average.

In ONTARIO, West and South-West District it was 5.82 in., or 3.60 in. above the average. In the North and North-West District it was 2.65 in., or 0.10 in. above the average. In the Central District it was 3.50 in., or 1.62 in. above the average. And in the East and North-East District it was 2.60 in., or 0.29 in. above the average.

In QUEBEC it was 2.96 in., or 0.27 in. above the average.

In NEW BRUNSWICK it was 3.08 in., or 0.21 in. below the average.

In NOVA SCOTIA it was 4.10 in., or 0.73 in. above the average.

In PRINCE EDWARD ISLAND it was 3.39 in. or 0.38 in. above the average.

Rainfall 5 in. and upwards during month : —

BRITISH COLUMBIA—Agassiz, 5.16 in.

ONTARIO—Deseronto, 6.28 in.; London, 6.74 in.; Little Forks, 6.10 in.; Port Stanley, 7.24 in.; Dealtown, 7.73 in.; Cayuga, 5.92 in.; Wilton Grove, 6.37 in.; St. Thomas, 5.88 in.; Cowal, 6.07 in.; Watford, 5.24 in.; Coldstream, 5.17 in.; Blenheim, 5.95 in.; Cottam, 6.76 in.; DeCewsville, 5.74 in.; St. George, 5.55 in.; Pelee Island, 12.13 in.; Kingsville, 8.03 in.; Ridgetown, 8.40 in.; Brantford, 5.48 in.; Paris, 5.66 in.; Stony Creek, 5.32 in.; St. Mary's, 5.81 in.; Sombra, 5.70 in.; Fort Francis, 6.01 in.

NOVA SCOTIA—Sydney, 5.21 in.; Halifax, 5.46 in.

Rainfall 1 inch and upwards in 24 hours :—

1. Dealtown, 1.77 in.; Cowal, 1.33 in.; Wyoming, 1.40 in.; Point Pelee, 2.60 in.; Kingsville, 1.10 in.
2. Glastonbury, 1.00 in.; Sarnia, 1.09 in.; Cottam, 1.70 in.; Kingsville, 1.14 in.; Ridgetown, 1.14 in.; Sombra, 1.04 in.; Port Stanley, 1.13 in.
3. Cape Chatte, 1.23 in.; Point Pelee, 2.00 in.
5. Wyoming, 1.00 in.; Channel, 2.33 in.; Birnam, 1.48 in.; Little Forks, 1.00 in.
6. Cottam, 1.23 in.; Fort Francis, 1.12 in.
10. Dealtown, 1.34 in.; St. Thomas, 1.01 in.; Wyoming, 1.00 in.; Lion's Head, 1.29 in.; Point Pelee, 2.50 in.; Kingsville, 1.21 in.; Ridgetown, 1.15 in.
11. Bancroft, 1.07 in.; Cottam, 1.00 in.; Ridgetown, 1.06 in.
12. Port Hastings, 1.40 in.
17. Barclay, 2.20 in.
18. Little Forks, 1.00 in.
19. Cottam, 1.33 in.; Shannonville, 1.00 in.; Fort Francis, 2.07 in.
20. Brantford, 1.02 in.; Paris, 1.09 in.; Kingston, 1.35 in.
21. Willow Grove, 1.05 in.; St. Thomas, 1.03 in.; Stony Creek 1.10 in.

22. Port Hastings, 190 in.; Pictou, 130 in.; Halifax, 100 in.
23. Channel, 100 in.; Dorchester, 117 in.; Dalhousie, 181 in.; Digby, 100 in.; Point Lepreaux, 105 in.; Sable Island, 135 in.; Point des Monts 160 in.; Sydney, 186.
25. Ennismore, 103 in.; Point Pelee, 120 in.; St. Mary's, 120 in.; Lindsay, 153 in.; Little Forks, 110 in.
27. Abbotsford, 128 in.; Brome, 192 in.; Richmond, 183 in.; Deseronto, 122 in.; Little Forks, 100 in.; Petrolea, 115 in.; Quebec, 102 in.
28. Beaver Creek, 117 in.; Agassiz, 195 in.; Digby, 101 in.; Kilmahumaig, 113 in.; Fort Francis, 100 in.; Little Forks, 100 in.; Truro, 177 in.; Arden, 120 in.
29. Anticosti, W.P., 125 in.
31. Yarmouth, 126 in.

SNOWFALL.

MANITOBA AND N.W.T.—Snow generally fell in the beginning and end of the month; at Hartney, 25 in.; Selkirk, Turtle Mountain, 2 in.; De Clare, Fort Ellice, 45 in.; Rosebank, 3 in.; Fairburn, 33 in.; Shoal Lake, Treherne, 5 in.; Morris, Arden, Oakbank, Pembina Crossing, Clandeboye, 3 in.; Oak River, Morden, 45 in.; Hillview, 1 in.; Norquay, 53 in.; Belmont, Pilot Mound, Rapid City, Beaver Creek, Gretna, 1 in.; Elkhorn, 3 in.; Banff, 26 in.; Shoal Lake, Channel Island, Glen Adelaide, St. Albans, 15 in.; Russell, 0.8 in.

IN ONTARIO.—Georgetown, Bareley, Scarborough, Nipigon, 8 in.; Cartier, 1 in.; Uplands, Savanne, 5 in.; Heron Bay, 3 in.; Fort Francis, 34 in.; Little Forks, 15 in.; (5 in. fell on 6th) (10 in. on 19th) Buda, 9 in.

IN QUEBEC.—Richmond.

NEW BRUNSWICK.—Dorchester.

NOVA SCOTIA.—Port Hastings, Digby.

P. E. ISLAND.—Kilmahumaig.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1. Hillview, Saskatoon, I; St. Albans II; Georgetown, Nanaimo, II; Sydney, III; Esquimalt, II; Truro, III; Wallace, II.

2. Calvin, Clandeboye, *bright*, Henrietta, II; Posen, II; Oakbank, II; Mattawa, Aurora, IV; Sydney, III; Esquimalt, II; Alexandria, IV; Prince Albert, II.

3. Pembina Crossing, II; Winnipeg, Posen, II; Glen Adelaide, Winnipeg, Wallace, III.

4. Posen, IV; Channel Island, IV; Saskatoon, IV; Beatrice, Winnipeg, Wallace, III; Prince Albert, IV.

5. Dorchester, N.B., Glen Adelaide, Truro, IV; Father Point, IV; Prince Albert, IV.

6. Channel Island, IV; Fort Francis, I.

7. Clandeboye, *bright*; Winnipeg, Oakbank, III; Savanne, Sombra, IV; Winnipeg.

8. Egremont, IV; Elora.

10. Little Forks, III.

11. Little Forks, IV.

13. Savanne.

14. Barrie, Hillview, Esquimalt, IV; Medicine Hat, IV.

15. Wallace, III.

16. Gravenhurst, II; Fredericton, Winnipeg, Deseronto, III; Alexandria II; Coldwater IV; Calvin, Pembina Crossing, IV; Clontarf, IV; Axe Lake, I; Joly, Novar, III; Egremont II; Fort Ellice, I; Channel Island, Oakbank, I; Savanne, Sharon, II; Haliburton, IV; Elora, Lucknow, Sombra, IV; Beatrice.

17. Oakbank, I; Savanne, Alexandria, IV; Wallace, III; Port Arthur, II.

18. Calvin, I; Huntsville, II; Midland, IV; Burk's Falls, IV; Belleville, *brilliant*; Lennoxville, III; Pembina Crossing, I; Hillview, Bancroft, IV; Banff, IV; Clontarf, II; Axe Lake, I; Joly, Novar, Fort Ellice, III; Posen, II; Saskatoon, II; Elora, Mattawa, Gravenhurst, IV; St. Albans, Beatrice, Russell, Richmond, II; Deseronto, I; Lindsay, III; Lennoxville, IV; Ottawa, IV; Alexandria, Yarmouth, I.

19. Hillview, Banff, IV ; Glen Adelaide, Georgetown, Sydney, III.
20. Pembina Crossing, III ; Savanne.
21. Savanne, Elkhorn, Russell, III ; Nanaimo, III ; Winnipeg, Port Arthur, II.
22. Savanne.
27. Savanne, Dorchester, N.B., Peterborough, III ; Elora, Zurich, Durham, IV.
29. Kingsville, Elora.
30. Channel Island, IV ; Esquimalt, IV ; Alexandria, IV.
31. Pembina Crossing, IV ; Hillview, Channel Island, IV ; Durham, IV.

Thunder recorded on the following dates :—

1. Birnam, Ridgetown, Kingsville, Pelee Island.
2. Owen Sound, Kingsville, Pelee Island.
3. Zurich, Gravenhurst, Paris, Birnam, Ridgetown, Kingsville, Pelee Island, Welland, Whiteside, Haliburton, Bognor, Sharon, Point Clark, Novar, Bancroft, Woodstock, Deseronto, Durham.
4. Kingsville, Pelee Island, Kilmahumaig, Egremont, Deseronto.
5. Birnam, Kingsville, Pelee Island.
6. Ridgetown, Kingsville, Cottam.
10. Pelee Island.
11. Cottam.
14. Kilmahumaig.
15. Bradwardine, Shoal Lake, Elora, Ridgetown, Kingsville.
16. Treherne, Pembina Crossing, Norquay, Belmont.
17. Rosebank, Treherne, Oakbank, Hillview, Rapid City, St. Albans.
18. Ridgetown, Kingsville, Pelee Island.
19. Zurich, Pelee Island, Cottam.
20. Pelee Island.
23. Hillview, Elkhorn, Posen.
24. Pembina Crossing, Pelee Island.
25. Treherne, Stoney Creek, Paris, Birnam, Elora, Kingsville, Pelee Island, Peterborough, Welland, De Cewsville, Cartier, Bognor, Norwood, Sharon, Egremont, Woodstock, London, Lindsay, Alexandria, Durham, Guelph.
26. Norquay, St. Hyacinthe, Birnam, Ridgetown, Pelee Island, Elkhorn, Saskatoon, Cottam, Egremont, Henrietta, Bancroft.
27. Fort Ellice, Hillview, Russell, Birnam, Glen Adelaide, Elkhorn, Deseronto, Lennoxville, Alexandria, Petrolia, Wallace.
28. Digby, Agassiz.
29. Owen Sound, Point Clark.
31. Stoney Creek, Gravenhurst, Owen Sound, Paris, Birnam, Elora, Ridgetown, London, Kingsville, Peterborough, Whiteside, Point Clark, Egremont, Novar, Woodstock.

Frost occurred on—

1. Axe Lake, Richmond, Cape Magdalene, Russell, Chaplin, Anticosti, Cape Chatte, Bicquet, Point Des Monts, St. Hyacinthe.
2. Quamichan.
4. Pictou, Russell.
5. Rapid City, Bancroft, Axe Lake, Sprucedale, Heron Bay, Nepigon, Peterborough, Gravenhurst, Beatrice, Whiteside, Clontarf.
6. Richmond, Kilmahumaig, Nepigon, Mattawa, Brome, Cape Chatte.
7. Kilmahumaig, Cowal, *ice*, Thompson, Kingsville, Russell, Brome, St. Thomas, *ice*, Calvin, *ice*.
8. Bancroft, Axe Lake, Kilmahumaig, Nepigon, Kingsville, Elora, Birnam, Souris, Gravenhurst, Lucknow, St. Mary's, Sombra, Beatrice, St. Thomas, *ice*.
9. Birnam, Owen Sound, Brome.
10. Bancroft, Pictou, Richmond, Brome.
11. Morden, Dorchester, Russell, Dalhousie, Georgetown.
12. Axe Lake, Savanne, Dalhousie.
13. Bancroft, Clontarf, Richmond, Sprucedale, Uplands, Lakefield, Elora, Brantford, Birnam, Mattawa, Lucknow, Dalhousie, Clontarf.
14. Kilmahumaig, Sprucedale, Savanne, Uplands, Mattawa, Russell.

15. Nepigon.
16. Fort Francis, Savanne, Russell, Quamichan.
17. Bancroft, Sprucedale, Savanne, Uplands, Mattawa, Egremont.
19. Fort Ellice, *cats and wheat cut*, Richmond, Fort Francis, Russell, Posen.
20. Shoal Lake, Fort Francis, Fort Osborne, Oakbank, Posen, Shoal Lake, Dalhousie.
21. Shoal Lake, *cut wheat*, Dorchester.
22. St. Albans.
23. Savanne.
24. Mattawa, Shoal Lake, Egremont, St. Thomas.
25. Hillview, Savanne.
26. Fort Ellice, Hillview, Russell, Glen Adelaide, Shoal Lake.
27. Fort Francis, Savanne.
28. DeClare, Fort Ellice, Sprucedale, Uplands, Thompson, Elora, Birnam, Mattawa, Beatrice Whiteside, Egremont, St. Thomas, *icc*.
29. Turtle Mountain, Fort Ellice, Rosebank, Saskatoon.
30. Rosebank, Calvin, Glen Adelaide, Shoal Lake, Elkhorn, Saskatoon.
31. Claudeboye, *heavy*, St. Albans, Glen Adelaide, Oakbank, Shoal Lake, Elkhorn.

Migration of Spring Birds, &c.

CANARIES.—Cayuga, 4th ; Posen, 19th ; Sharon, 4th ; Bognor, 23rd.

WHIPPOORWILL.—Calvin, 4th ; Pembina Crossing, 14th ; Egremont, 7th ; Posen, 25th ; Sombra, 1st.

BLUE JAYS.—Posen, 12th.

HUMMING BIRD.—Thedford, 9th ; Owen Sound, 17th ; Sombra, 17th ; Gravenhurst, 16th ; Birman, 11th ; De Cewsville, 8th ; Bognor, 30th.

SCARLET TAXAGER.—Sombra, 7th.

ORIOLE.—Thedford, 17th ; Pembina Crossing, 23rd ; Owen Sound, 12th ; St. Mary's, 5th ; Birnam, 16th ; De Cewsville, 13th ; Sharon, 13th.

BOB O'LINK.—Posen, 16th ; Sombra, 3rd ; Paris, 2nd ; De Cewsville, 4th.

CEDAR BIRD.—Thedford, 24th.

SWALLOWS.—Fort Ellice, 8th ; Posen, 22nd ; Sombra, 3rd ; St. Mary's, 10th ; Gravenhurst, 13th ; Paris, 1st ; Bognor, 17th ; Savanne, 12th ; Dorchester, 15th ; Kilmahumaig, 21st ; Clontarf, 1st.

SNIPES.—Fort Ellice, 8th.

NIGHT HAWKS.—Egremont, 20th.

FROGS.—Thedford, 4th ; Saskatoon, 12th ; Paris, 3rd ; Savanne, 5th.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF MAY, 1892.

	HOURS ENDING															
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.
ESQUIMALT		0 09	0 31	0 39	0 56	0 65	0 62	0 62	0 63	0 59	0 52	0 48	0 47	0 42	0 69	.
AGASSIZ, B.C.		0 00	22	37	44	46	49	48	52	52	45	45	39	18	02	.
BRANDON.....	S.	29	38	38	33	27	19	18	27	24	27	28	32	42	38	.
INDIAN HEAD.....		19	32	48	45	53	53	50	49	46	41	40	40	35	19	.
WINNIPEG.....	S.	25	45	51	46	46	53	46	44	49	35	33	38	49	39	S.
KINGSVILLE.....		12	28	39	37	38	45	46	46	47	46	45	39	26	09	.
WOODSTOCK.....		19	39	39	31	31	34	35	33	34	39	40	38	39	42	S.
TORONTO.....		14	35	41	49	48	43	42	39	43	43	40	36	33	19	.
LINDSAY.....	04	20	33	41	49	44	52	47	50	42	41	49	34	49	35	13
BARRIE.....		18	31	36	38	39	43	43	44	43	42	39	38	39	23	.
KINGSTON	S.	25	39	44	51	57	54	50	53	48	44	38	35	39	15	.
.....																.
MONTREAL.....	10	18	41	44	44	47	51	48	51	49	47	44	40	32	19	.
FREDERICTON		31	44	45	47	42	49	51	48	49	45	49	35	33	20	.
SYDNEY.....		14	19	26	34	39	41	38	36	39	39	47	45	38	27	03

	ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	KINGSVILLE.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)	0.41	0.33	0.28	0.38	0.32	0.33	0.31	0.35	0.39	0.35	0.39	0.43	0.38	0.32
MAXIMUM DAILY AMOUNT.....	0.81	0.80	0.90	0.90	0.88	0.77	0.90	0.87	0.99	0.91	0.88	0.98	0.94	0.93
DATE	2	1	22	20	26	30	9	16	17	9	17	9	10	11
NO. OF DAYS COMPLETELY CLOUDED.....	7	8	5	5	6	4	11	7	5	7	10	9	6	11

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 558. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
MANITOBA.....	65	50	12	3	86.1
LOWER LAKE REGION.....	106	79	21	6	84.4
UPPER ST. LAWRENCE.....	93	69	20	4	84.9
LOWER ST. LAWRENCE.....	99	81	9	9	86.4
GULF.....	98	68	15	15	77.0
MARITIME PROVINCES.....	97	70	22	5	83.5
TOTAL.....	558	417	99	42	83.6

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions the reports from the agents at the "Probability Stations," as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer B. C. Webber.

STORM WARNINGS.

During the month warnings on the approach of one storm was issued to our agents, and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 30, of which 30, or 100.0 per cent. were verified. At 17 stations, however, the force did not reach that indicated by the signals displayed; 2 stations reported warnings received late, owing to delay in issue.

In conjunction with the warnings, predictions as to the probable directions of the wind were given, and of the 30 warnings verified as to force, 1 was fully verified and 29 partly verified.

At 10.40 a.m. on the 18th, cautionary signals were ordered up at all Lake Superior stations for a moderate gale from N.E. N.N.W., and at other Lake stations for a moderate gale from S.E. to S. and S.W. in advance of a cyclone which was then centred over Iowa and had moved up from the Southwest States. The following night as the cyclone had made considerable development, signals were changed to No. 4 for a heavy gale from the S. to W. and N.W. During the 18th and 19th, a northeasterly gale was blowing on Lake Superior, and a moderate to fresh E. to S.W. gale on the other Lakes. The cyclone afterwards became unimportant.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR MAY, 1892.

There were some important disturbances recorded during the month, the principal occurring on the 1st and 18th.

The 1st opened up with the magnets very much disturbed. At 0.3 a.m. the declination magnet was on a westerly sweep of $1^{\circ} 25'$, this change took place in about half an hour. After reaching its maximum it oscillated rapidly and gradually moved east, rapid oscillations being main-

tained. After 5 a.m. the disturbance became less active, during the afternoon signs of increased activity were shown, and a little before 10 p.m. the storm increased and was particularly active between 9.40 and 2 a.m. At 9.40 the magnet took an easterly swing of $52'$, this was followed by a westerly movement of $1^{\circ} 28'$ in a short time. On the return movement to the normal the magnet became much quieter, but at 0.30 the disturbance burst out again, the magnet swinging $54'$ to the east in twenty-seven minutes, it then gradually resumed its normal reading oscillating at the same time. Both forces previous to midnight of the 30th of April were generally steady, and at midnight a rapid decrease began, especially on the horizontal force curve. A change of .0055 C.G.S. taking place in 27 minutes, rapid oscillations followed, and both needles slowly resumed their normal positions. During the following afternoon the forces were above their respective values, and were decreased during the evening and night, and a still further decrease commenced after midnight, a marked minimum taking place at 0.57 a.m. of the 2nd, after which the needles gradually resumed their normal readings. A gradual decrease of the v.f. is recorded on the night of the 3rd, and the declination curve also presents some abnormal changes on the evening of the same day, and an abrupt westerly swing at 1.50 a.m. of the 4th, it quickly resumed its normal reading, and continued very steady up to the night of the 4th, when a slight disturbance began which continued to the morning of the 8th. On the night of the 7th and early morning of the 8th, there was a tendency for the movements to increase.

There was nothing of importance recorded up to the 16th when a slight disturbance began but passed off during the afternoon of the 17th. The magnet only remained steady for a brief period for at 3.05 a.m. of the 18th the declination magnet was suddenly deflected to the east, and immediately afterwards to the west. After this the movements gradually increased, the magnet moving west. After 4 a.m. a series of vibrations began, the reading varying but little from the normal, during the evening the disturbance became decidedly more active, and from 7.50 to midnight one of the most important storms that we have had for some time was recorded, the principal movements taking place a little before 8 p.m. At 1.50 the magnet moved $1^{\circ} 14'$ east in a short time, this was followed by a westerly swing of $1^{\circ} 40'$ in five minutes. Between 8 and 10 p.m. the magnet was oscillating upwards of $1^{\circ} 15'$. A diminution in the storm appeared before 10 p.m., but at 10.55 increased activity again set in, the magnet taking a westerly movement of $1^{\circ} 25'$ in a short time, the maximum reading occurring at 11.02 p.m., and by 11.18 p.m. it had moved east over $1^{\circ} 40'$. After midnight the magnet became quieter, but at 2 a.m. of the 19th signs of a renewal of the storm was recorded, the disturbance, however, shortly afterwards died away. At the commencement of this storm both forces were suddenly increased. A general decrease following, between 6 a.m. and noon of the 18th, a steady increase of the v.f. component was shown a little after 6 p.m. A rapid change brought both components to their maximum readings at 6.10 p.m. After this hour a rapid decrease commenced, the spot of light going off the h.f. curve at 11 p.m.; the change up to this time being .0118 C.G.S. During the evening and night some rapid changes of the h.f. were going on. One in particular was an extremely rapid diminution of force which set in at 10.58 p.m. The magnet would sometimes move rapidly, then pause for a short time and again take up the quick swing; after 2 a.m. both needles gradually resumed their normal position. At 10 a.m. of the 19th a little irregularity was shown, but the magnets shortly quieted down. Some minute vibrations were recorded on the following night. On the afternoon of the 21st a steady easterly change of the declination needle was well marked. A slight disturbance was felt on the morning of the 22nd, and a steady westerly movement of the declination magnet set in after 6 a.m., attended by a decrease of the horizontal force. A quiet period followed, lasting up to the 29th, with the exception of a little irregularity on the evening of the 27th. On the mornings of the 26th, 27th and 28th the horary curve of the declination was well marked. A slight disturbance set in on the morning of the 30th and continued to the end of the month.

On the 7th, faint auroral light in N., also on the 16th. On the 18th very active auroral display, streamers and brilliant light alternating, rapid pulsations extending 60° south of zenith.

On the 30th faint auroral light in N.E., 11 to 11.30 p.m. On the 4th, 8th, 12th, 17th, 26th, 27th, 28th and 29th the sky was clear, but no aurora was observed; on all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL,

Director.

METEOROLOGICAL OFFICE,

TORONTO, July 14th, 1892.

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

JUNE, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraph reporting stations was above the normal of eighteen years in the N. W. Territories and Quebec and below in Ontario and the Maritime Provinces, the greatest defect occurring in St. John, Nfld., amounting to 0.10 in.

During the 1st and 2nd, a trough of low pressure extended from the South-west States to the Gulf of St. Lawrence, in which, on the morning of the 1st, a small cyclone was centred over Missouri. Heavy rains prevailed in the Lower Lake district and the temperature was generally high. The low pressure trough moved south of the Lake and the cyclone dispersed. Then an important high pressure area spread over the Lakes and Eastern districts, moving off the New England coast on the 5th. It gave a short period of fine cooler weather everywhere excepting South-western Ontario.

Cyclonic conditions set in over Northern Quebec during the 5th, and showery weather was the rule in Ontario during that day, and in Eastern Canada during the 5th and 6th.

An anti-cyclone followed on the evening of the 6th, moving from north of Lake Superior south-eastward to the New England coast. It gave a short period of fine weather with moderate temperatures until the 8th, when it again became cyclonic over the Lakes and Eastern Provinces, and moderately warm, showery weather was general in Ontario during the 8th, and a few showers occurred in Quebec.

There was a slight improvement in pressure and weather in the Lake district during the night of the 9th, and anti-cyclonic conditions with fair, moderately warm weather prevailed over Ontario and Eastern Canada until the 13th. The temperature gradually increased and on that day exceeded 90° Fahr. at some places in Ontario and Quebec.

In the North-west a cyclone hovered from the 1st until the 3rd, which on the 2nd became an important depression, causing fresh to strong south-east to south-west gales and showery weather. It then gradually dispersed, and by the morning of the 4th had entirely disappeared. A period of fine, warm weather then set in and continued until the 7th, when a moderate cyclone caused some showers in Alberta; and on the 8th and 9th in Assiniboia and Manitoba.

These cyclonic conditions continued, and on the 10th, an important cyclone, which developed over the Western States, moved northward, passing over Manitoba on the 11th where it gave some heavy thunder-storms, which next day also occurred over Assiniboia. There were also a few local showers in Alberta.

A slight improvement in pressure took place in the North-west on the 13th, when the weather was generally fine and pleasantly warm.

After the 13th cyclonic conditions in Eastern Canada gave a showery day there during the 14th, but the weather was fine in Ontario accompanied by increasing pressure. This high pressure extended to Eastern Canada next day, and fine, pleasant weather obtained everywhere till the 18th, with the exception of a few local showers in Quebec and New Brunswick on the 16th, and a temporary rise in the temperature to 90° and 86° Fahr. in Southern Ontario on the same day.

During the night of the 18th, it became more cyclonic over the Lake and Eastern Canada, and showery weather became general during the 19th.

Until the 25th, cyclonic conditions prevailed over these districts, unimportant depressions followed each other in quick succession, and although the weather was for the most part fair and pleasant, it was unsettled, and local showers or thunder-storms frequently occurred.

On the 26th there was a slight improvement in pressure, but it was of short duration, for that night a slight depression over the Middle Mississippi Valley developed into a cyclone of some importance. It passed north-east across the Lake district on the 27th where it caused a heavy rain-fall, local thunder-storms and local high winds. By the night of the 27th, it was raining heavily in Quebec, and next morning rain had extended throughout Eastern Canada. This was followed by fair warm weather in Quebec and Ontario on the 28th, and in the Maritime Provinces on the 29th.

As this depression, however, hovered till the end of the month over Quebec, it caused showery weather in Ontario and Quebec on the 30th.

In the North-west districts from the 13th to the 22nd the pressure conditions were unimportant, but generally of a cyclonic nature ; the weather being fine and warm with occasional scattered showers.

On the 22nd an anti-cyclone spread over these districts, and cooler, fair weather prevailed till the 24th. After this there was a general increase in temperature, especially in Assiniboia, where the maximum temperature on the 26th, ranged from 82° to 88° Fahr.

On this day there was a change to the cyclonic type, and fair, warm weather with local thunder-storms obtained until the 29th. On this day an anti-cyclone passed quickly south-eastward across the territories, bringing lower temperatures, but during the 30th it was replaced by another cyclone and very warm weather prevailed on this day in Alberta, where the maximum temperature ranged from 80° to 94° Fahr.

TEMPERATURE.

The average temperature throughout the Dominion differed little from the normal in Ontario and Quebec, it was in excess in the Maritime Provinces, and in Manitoba and North-west Territories it was slightly in defect.

The highest and lowest Temperatures in each Province during June were :

British Columbia, 96°·0 on 26th, at Griffin Lake ; 30°·0 on 20th at Barkerville ; 30°·0 on 1st at Griffins Lake.

North-west Territories, 93°·5 on 30th, at Medicine Hat ; 30°·0 on 29th at Saskatoon ; 30°·0 on 13th at Oonikup.

Manitoba, 90°·5 on 18th, at St. Alban ; 29°·8 on 30th, at Brandon.

Ontario, 95°·0 on 13th, at Rockliffe ; 22°·2 on 30th, at Fort Francis.

Quebec, 89°·8 on 1st, at Richmond ; 33°·0 on 10th, at Chicoutimi.

New Brunswick, 86°·0 on 30th, at Chatham ; 31°·0 on 10th, at Dorchester.

Nova Scotia, 88°·4 on 14th, at Halifax ; 31°·4 on 5th, at Sydney.

Prince Edward Island, 82°·8 on 30th, at Georgetown ; 34°·3 on 13th, at Kilmahumaig.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JUNE, 1892.

	PRESSURE IN INCHES.				TEMPERATURE OF AIR.				Mean amount of cloud.	DIRECTION OF WIND FROM.								VELOCITY OF WIND.				PRECIPITATION.														
	Mean actual.	Mean reduced.	Lowest.	Range.	Mean.	Diff. from aver- age.	Years observ.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Greatest daily range.	Mean temperature of dewpoint.	Mean relative humi- dity.	No. of days completely clouded.	N.	N. E.	E.	S. E.	S.	W.	N. W.	C.	Total number of hours.	Mean, miles per hour.	Highest days velocity.	Date and direc- tion.	Amount. in.	Diff. from aver- age.	No. of days.	No. of Auroras.	No. of Thunderstorms.	No. of Fogs.		
N. W. TERRITORIES:	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.		
Medicine Hat.....	29.76	30.30	29.32	0.98	62.2	-1.5	893.5	30	35.8	30	35.8	4	28.4	43.3	.....	.....	6	6	7	3	9	8	6	14	6	5	60	.....	38.0	2 W	0.89	-2.14	16.14	0	0	
Edmonton.....	29.82	30.17	29.39	0.78	55.9	-0.7	988.0	30	33.0	30	33.0	3	25.7	37.0	.....	.....	7	5	4	3	8	1	3	2	16	18	60	.....	18.0	20NW	2.54	+1.03	18.12	0	0	
Pleasant Fork.....	29.86	30.31	29.45	0.86	60.4	-	84.0	26	35.0	23	34.8	23	24.8	41.0	.....	.....	5	1	4	6	7	6	9	13	6	60	.....	24.0	1 E	2.56	-	16.14	0	0		
Battleford.....	29.86	30.31	29.45	0.86	58.3	-2.0	684.0	26	37.4	22	36.7	22	26.7	37.0	.....	.....	5	1	4	6	7	6	9	13	6	60	.....	29.0	2SW	3.96	+0.41	11.19	0	0		
Swift Current.....	29.88	30.33	29.41	0.92	56.6	-4.1	878.9	18	35.3	22	34.9	22	23.9	33.5	.....	.....	6	1	6	6	2	9	8	7	10	3	60	.....	19.8	3 W	2.54	-0.81	8.23	0	0	
Qu Appelle.....	29.80	30.30	29.41	0.89	56.4	-1.1	582.3	7	31.2	13	27.8	43.0	.....	.....	.....	.....	5	1	6	2	6	2	3	5	7	27	60	.....	20.0	2	1.89	-1.00	14.16	0	0	
Prince Albert.....	29.80	30.30	29.41	0.89	56.4	-	84.0	18	33.0	24	26.1	43.0	.....	.....	.....	.....	5	3	16	4	1	6	11	7	8	0	60	.....	11.19	0	2.40	-	11.19	0	0	
Wallace.....	28.06	28.41	27.64	0.77	56.4	-	82.5	26	30.0	29	25.7	38.8	.....	.....	.....	.....	5	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.34	-	7.23	0	1		
Saskatoon.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Gravelly.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Calgary.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Chaplin.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Indian Head.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Opiskup.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Cochan.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Glen Adelaide.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
Benetta.....	29.81	30.24	29.30	1.04	55.8	-0.2	792.0	30	30.7	2	30.0	47.8	.....	.....	.....	.....	7	3	4	3	0	0	0	13	2	38	60	.....	28.3	21NW	1.07	-1.27	14.16	0	0	
MANITOBA:																																				
Minnedosa.....	29.84	30.18	29.25	0.92	58.6	-1.7	983.3	18	26.5	30	28.8	47.3	.....	.....	.....	.....	6	4	3	6	6	2	7	15	10	5	60	.....	25.3	2SE	1.03	-1.79	18.12	4	0	
Winnipeg.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Dauphin.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Hillview.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Elkhorn.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Portage la Prairie.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
St. Albans.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Fort Osborne.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Oak Bank.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Fort Ellice.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	16	23.2	34.3	.....	.....	.....	.....	5	1	36	20	13	36	10	36	26	39	14	230	.....	27.7	2 SE	1.40	-1.99	17.13	0	0
Port Arthur.....	29.86	30.29	29.34	0.95	60.4	-0.6	1983.8	11	37.5	1																										

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION, &c.—Continued.

	PRESSURE IN INCHES.				TEMPERATURE OF AIR.						DIRECTION OF WIND FROM.						VELOCITY OF WIND.			PRECIPITATION.																
	Mean actual.	Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observ.	Highest.	Date.	Lowest.	Date.	Highest.	Mean daily range.	Greatest daily range.	Mean relative humidity.	Mean amount of cloud.	No. of days completely clouded.	N.	N. E.	S. E.	S. W.	W.	N. W.	C.	Total number of hours.	Mean miles per hour.	Highest velocity.	Date and direction.	Amount.	Difference from average.	No. of fair days.	No. of Auroras.	No. of Thunder storms.		
ONTARIO—Continued.	in.	in.	in.	in.	in.	°	°		°		°		°	°	°																					
Axe Lake.....						62.0	+ 1.6	5.80-0	13	40.0				7 20.4 38.0																						
Coldwater.....						65.4	+ 0.5	6.94-5	12	41.5				7 20.7 38.8																						
Beatrice.....						61.6	+ 1.6	6.85-0	13	41.0				7 19.2 33.0																						
Gravenhurst.....						64.2	+ 1.7	21.89-0	13	40.0				7 21.0 34.0																						
North Bruce.....						63.2	+ 1.0	4.86-0	13	48.0				30																						
Rockliffe.....						62.5	+ 2.4	15.95-0	13	35.0				7 20.3 45.0																						
Zurich.....						65.4	+ 2.3	10.90-0	12-15	47.0				27 25.2 38.0																						
Point Clark.....						63.1	+ 3.7	19.75-0	16	50.0				2																						
St. Mary's.....						67.2	+ 2.6	3.89-0	13	49.0				11 20.6 33.0																						
Paris.....						67.1	+ 1.0	2.92-0	12	45.0				3-11 22.5 40.0																						
Lucknow.....						65.6	+ 1.9	6.89-9	13	45.5				26 20.1 31.1																						
Bognor.....						63.0	+ 0.4	2.88-0	12	48.0				3																						
Biman.....						66.8	+ 2.7	9.81-1	12	45.1				26 19.8 32.9																						
Cottam.....						69.2	+ 2.2	3.94-0	16	55.0				3																						
Point Pelée.....						71.0	+ 3.5	14.86-5	12	49.0				3 14.2 24.0																						
Kingsville.....						70.1	+ 1.5	2.90-5	16	54.8				3 14.6 22.5																						
Weland.....						67.7	+ 3.7	5.86-0	16	49.0				10 19.7 26.0																						
Ridgeway.....						68.0	+ 3.1	6.92-0	16	44.0				26 22.5 33.0																						
Woodstock.....						66.9	+ 3.1	18.91-4	12	46.5				11 21.4 34.5																						
London.....						69.3	+ 4.2	9.90-9	12	48.0				11 21.3 38.0																						
Port Stanley.....						65.4	+ 2.1	1.84-2	25	49.5				11 17.7 26.4																						
Brantford.....						66.8	+ 0.8	11.00-0	16	40.0				4 22.2 36.0																						
St. George.....						66.8	+ 1.8	8.90-0	13-16	51.0																										
Port Dover.....						65.6	+ 1.5	18.82-8	13	50.0				11 14.9 25.7																						
Guelph.....						63.4	+ 0.4	11.89-0	14	39.6				24 26.3 40.5																						
Elora.....						64.7	+ 1.4	9.92-0	13	45.0				11 21.3 38.0																						
Petrolia.....						68.1	+ 2.9	4.88-3	16	43.0				26 24.5 34.6																						
Niagara Falls, N.....						66.6	+ 1.7	7.86-0	16	52.0				25																						
Sault Ste. Marie.....						60.5	+ 1.7	2.87-4	12	40.2				15 22.5 34.4																						
DeCresville.....						65.8	+ 1.7	3.84-0	12	51.0																										
Sombra.....						68.1	+ 2.6	4.90-0	16	50.0				3 20.8 31.8																						
Mattawa.....						62.5	+ 2.0	6.91-9	13	35.5				7 25.2 44.4																						
Collingwood.....						65.0	+ ...	90.5	13	48.0				7 16.6 29.5																						
Stony Creek.....						67.3	+ 2.1	8.93-0	12	48.0				11 19.0 38.0																						
Georgina.....						68.7	+ 4.1	4.94-0	12	40.8				30 24.4 38.0																						
Sharon.....						65.4	+ 2.0	6.89-0	12	51.0				30																						
Toronto.....						65.0	+ 2.9	52.85-9	12-16	48.1				11 17.4 31.8																						
Alton.....						60.8	+ 1.4	5.85-7	13	41.0				5 18.9 30.8																						
Lindsay.....						63.2	+ 2.5	12.91-2	13	46.5				7 20.9 35.0																						
Norwood.....						65.2	+ 2.0	12.86-0	14	49.5				7 17.4 35.0																						
Oshawa.....						65.4	+ 3.2	7.84-0	17	49.0				11 16.2 26.0																						
Deseronto.....						66.8	+ 0.8	9.80-0	12	50.5				5-18 20.1 31.5																						
Kingston.....						62.3	+ 0.8	18.79-5	22	50.0				15 13.3 31.4																						
Ottawa.....						64.8	+ 0.6	18.90-3	14	45.8				16 20.1 37.3																						
Lakefield.....						64.3	+ 0.6	18.90-3	14	45.8				16 20.1 37.3																						
Alexandria.....						65.6	+ 1.2	3.86-3	13	44.2				7 18.1 32.6																						
Benbow.....						64.6	+ 0.7	7.94-0	13	35.0				6 26.6 43.0																						
Peterborough.....						68.8	+ ...	97.0	13	46.0				11 21.2 39.0																						
Bancroft.....						63.3	+ 0.6	5.87-8	13	40.3				10 22.9 36.0																						
Haliburton.....						63.5	+ 0.9	4.89-0	13	41.0				7 20.6 36.0																						
Clontarf.....																																				

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Locality	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Quebec:																																				
Montreal.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
St. Hyacinthe.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Pasir Bay.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Richmond.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Chicoutimi.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Quebec.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Lennoxville.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Anticosti, W. P.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Brome.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Father Point.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Point des Monts.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Cape Chatte.....	29-30	30-35	29-49	0-87	65-7	+	1-1	18-8	6	1	48-2	10	11-0	29-4	57-4	69	6	0	32	52	70	34	84	99	192	140	16	720	12-9	29-8	13-NW	8-01	-4-65	2-8	1-9	3
Bicquet.....	29-30	30-35	29-49																																	

Locality	29-22	30-42	29-54	0-88	61-0	+	0-4	19-85-5	2	35-5	10	22-6	34-8	52-1	69	6	5	2	8	13	10	19	13	8	11	6	90	6-1	11-7	9SW	5-71	+3-00	24	6	0	1	1
New Brunswick :																																					
Fredricton.....	29-30	30-38	29-53	0-85	59-1	—	0-2	18-86-0	30	42-0	24	23-9	36-4	5	2	2	5	6	4	3	12	18	4	6	60	10-5	9W	2-57	-1-15	12	18	0	0	0
Chatham.....	29-37	30-17	29-59	0-58	65-3	+	2-2	18-83-0	21	30-0	8-10	30-1	42-0	60-0	81	4	1	0	1	22	0	0	28	2	29	8	90	9NW	2-07	-0-53	8	22	0	2	0
St. Andrews.....	29-01	30-37	29-50	0-87	56-9	—	0-1	18-87-6	14	30-0	10	20-6	32-0	5	8	4	3	1	12	10	8	3	5	14	60	4-54	+4-23	17	13	0	0	7
Grand Manan.....	29-34	30-39	29-50	0-83	53-2	—	1-3	8-82-1	14	41-8	10	16-6	37-6	7	7	4	1	4	4	10	11	6	6	14	60	30-0	10SW	3-98	+1-31	19	11	0	0	8
Point Lepreau.....	52-0	—	1-2	16-65-0	14	46-0	6	6	12	5	8	4	3	25	4	11	6	78	4-70	+2-26	10	20	0	0	3
St. John (City).....	29-35	30-40	29-54	0-86	55-4	—	0-4	32-83-0	14	41-0	10	23-5	32-0	5	5	9	0	7	0	0	0	31	0	24	52	5-03	+1-71	0	0	6
Dorchester.....	52-1	—	1-3	5-73-0	14	31-0	10	23-5	32-0	11-2	28SW	2-70	-1-24	10	30	2	3	7
Halifax.....	56-6	+	1-0	13-80-5	19	34-0	10	25	33-5	5	5	9	0	7	0	0	0	31	0	24	52	3-22	-0-72	7	33	0	0	2
Parker's Ridge.....	55-8	—	2-4	5-82-0	2	32-0	10	22	23-8-0	3-13	-1-15	8	22	0	0	2
NOVA SCOTIA :																																					
Halifax.....	29-36	30-37	29-50	0-87	57-4	—	0-0	18-88-4	14	41-0	5	21-1	37-6	45-2	71	6	5	8	0	0	11	0	18	4	8	11	60	8-0	28SE	3-63	+0-37	20	10	0	0	0
Sydney.....	29-30	30-38	29-51	0-87	54-2	—	0-6	21-80-0	30	31-4	5	20-8	33-6	5	0	12	6	1	9	57	31	19	26	19	180	17-2	9SW	0-92	-1-07	10	30	2	0	0
Yarmouth.....	29-36	30-39	29-49	0-90	54-9	—	0-0	12-69-2	14	40-6	8	14-5	22-6	7	11	10	1	2	6	13	15	9	4	0	60	19-5	28S	1-55	-1-01	22	8	0	0	12
Turo.....	29-35	30-43	29-60	0-83	53-2	—	0-4	13-84-0																													

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BRITISH COLUMBIA :																																						
Esquimaux.....	30.01	30.24	29.79	0.45	55.5	+	0.2	174.0	28	42.5	9	15.2	23.1	50.1	82	5	3	6	2	0	1	15	100	1	7	48	186	7.8	21.3	1	S	0.60	-0.66	11.19	2	0	0	
Quamichan.....	60.9	+	1.4	592.0	29	38.0	1	28.9	48.0	0.40	-0.55	3.27	0	1	0		
Barkerville.....	52.9	+	2.4	482.0	29	30.0	20	26.2	38.0	3.22	-0.18	8.22	0	3	0		
Agassiz.....	50.9	+	2.3	290.0	28	38.0	9	22.4	38.0	3.20	-0.15	12.18	0	1	0		
Port Moody.....	
Abbotsford.....	50.8	+	1.0	387.0	28	39.6	8	21.3	34.0	1.88	-4.12	11.19	0	0	0
Nanaimo.....	60.2	+	27	28.8	1	21.4	42.4	0.44	8.22	0	0	0	
Griffin Lake.....	60.7	-	28	30.0	1	36.2	49.0	7.23	0	2	0

STATIONS RECEIVED TOO LATE FOR THE MAY REVIEW.

PROVINCE.	STATION.	MEAN TEMP.	HIGHEST TEMPERATURE.		LOWEST TEMPERATURE.		PRECIPITATION.		AURORAS.	THUNDER- STORMS.
			Temp.	Date.	Temp.	Date.	Amount.	Days.		
		°	°		°		in.			
British Columbia	Spence's Bridge	60.92	57.5	20	31.0	2	0.42	4		
N. W. Territories	Oonikup	41.37	72.0	16	17.0	5	2.09	12		
Manitoba	Partage la Prairie	45.09	73.0	16-17	27.0	1-3	2.73	14	7, 8, 21, 27	16-17
Ontario	Alton	49.06	75.7	30	18.5	8	2.98	18		2-31
Quebec	Chicoutimi	47.68	78.2	31	20.9	1	2.60	6		4
New Brunswick	Parker's Ridge	45.94	72.0	31	22.0	1	3.27	8		

PRECIPITATION.

The rain during the month of June was in general above the normal, the excess being greatest in parts of West and Southwest Ontario and in parts of Quebec, the fall at some of the stations being almost phenomenal as to daily and monthly amounts.

The general distribution is as follows :—

In BRITISH COLUMBIA the rainfall was in general 1.46 in., or about 0.18 above the average.

In the NORTHWEST TERRITORIES, 2.28, about 0.50 in. below the average.

In MANITOBA the rainfall was 2.30 in., or 1.26 in. below the average.

In ONTARIO, West and South West District, it was 5.56 in., or 2.59 in. above the average. In the North and North-West District it was 3.76 in., or 1.16 in. above the average. In the Central District it was 4.67 in., or 2.23 in. above the average. And in the East and North-East District it was 4.17 in., or 1.89 in. above the average.

In QUEBEC it was 5.39 in., or 2.33 in. above the average.

In NEW BRUNSWICK it was 3.62 in., or 0.16 in. above the average.

In NOVA SCOTIA it was 2.42 in., or 0.73 in. below the average.

In PRINCE EDWARD ISLAND it was 2.06 in. or 0.76 in. below the average.

Monthly rainfall 5 in. and upwards during month :—

ONTARIO—Kingston, 5.44 in.; Rockliffe, 5.77 in.; Port Stanley, 5.36 in.; Port Dover, 6.01 in.; Woodstock, 9.50 in.; Little Forks, 5.60 in.; Alexandria, 9.08 in.; Coldwater, 5.58 in.; London, 12.32 in.; Ottawa, 6.19 in.; St. Thomas, 6.45 in.; Watford, 6.49 in.; Fergus, 5.00 in.; Wilton Grove, 8.57 in.; Princeton, 6.37 in.; Wyoming, 5.21 in.; Coldstream, 7.00 in.; Cayuga, 5.19 in.; Scarboro', 5.03 in.; Blenheim, 5.35 in.; Dealtown, 5.56 in.; Uplands, 5.27 in.; Shannonville, 5.41 in.; Elora, 5.70 in.; St. George, 5.75 in.; Georgina, 5.19 in.; DeCewsville, 5.64 in.; Haliburton, 5.01 in.; Sombra, 5.00 in.; Pelée Island, 5.19 in.; Kingsville, 5.78 in.; Ridgetown, 5.07 in.; Birnam, 8.07 in.; Gravenhurst, 5.19 in.; Brantford, 6.24 in.; St. Mary's, 9.16 in.; Paris, 7.10 in.; Alton, 6.26 in.; Bancroft, 6.11 in.; Toronto, 5.81 in.

QUEBEC—Montreal, 8.01 in.; St. Hyacinthe, 7.63 in.; Richmond, 10.10 in.; Chicoutimi, 5.72 in.; Quebec, 5.92 in.; Lennoxville, 9.22 in.; Brome, 15.36 in.

NEW BRUNSWICK—Fredericton, 5.71.

Rainfall 1 inch and upwards in 24 hours :—

1. Point Escuminac, 1.10 in.; Cartier, 1.05 in.; Dalhousie, 1.06 in.; St. Marys, 1.43 in.

2. Coldstream, 3.14 in.; Lion's Head, 1.15 in.; Huntsville, 1.30 in.; Glastonbury, 1.30 in.; Novar, 1.03 in.; Brantford, 1.52 in.; Axe Lake, 1.00 in.; Owen Sound, 1.08 in.; Edmonton, 1.95 in.; Chicoutimi, 1.18 in.

3. St. Thomas, 1.30 in.; Watford, 2.25 in.; Wilton Grove, 3.05 in.; Princeton, 2.15 in.; Wyoming, 1.73 in.; Thedford, 1.79 in.; Cowal, 1.34 in.; Dealtown, 1.13 in.; Port Hastings, 1.00 in.; Paris, 1.86 in.; St. Marys, 1.67 in.; Brantford, 2.26 in.; Ridgetown, 1.10 in.; Sombra, 2.24 in.; St. George, 1.07 in.;

Port Dover, 1'06 in.; Woodstock, 4'35 in.; Petrolea, 1'94 in.; London, 3'86 in.

4. Paris, 1'15 in. Little Forks, 2'10 in.

5. Scarborough, 1'04 in.; Richmond, 1'09 in.; St. Hyacinthe, 1'42 in.; Elora, 1'05 in.; Montreal, 1'35 in.

6. St. Hyacinthe, 1'14 in.; Fort Francis, 1'11 in.

8. Belleville, 2'01 in.; Shannonville, 2'05 in.; Swift Current, 2'08 in.

9. Wilton Grove, 1'55 in.; Presqu'Isle, 1'30 in.; Orangeville, 1'08 in.; Cartwright, 1'60 in.; Alton, 2'11 in.; Port Dover, 1'22 in.; London, 1'11 in.

11. Arden, 1'51 in.; Fort Ellice, 2'23 in.; Beaver Creek, 1'05 in.; Portage la Prairie, 1'21 in.; Wallace, 2'21 in.; Bermuda, 2'28 in.; Qu'Appelle, 1'69 in.; Indian Head, 2'06 in.

12. Glastonbury, 1'00 in.; Glen Adelaide, 2'10 in.; Bermuda, 1'14 in.; Little Forks, 1'00 in.

13. Foxton, 1'33 in.

14. Cartwright, 1'45 in.; Fairburn, 1'76 in.; Turtle Mountain, 1'03 in.; Rockliffe, 1'34 in.

15. Little Forks, 1'00 in.

16. Brome, 1'18 in.

18. Thompson, 1'51 in.; Pelee Island, 1'00 in.

19. Woodstock, 1'23 in.; Lennoxville, 2'09 in.; Coldwater, 1'78 in.; London, 2'29 in.; Toronto, 2'42 in.; Princeton, 1'04 in.; Scarborough, 1'16 in.; Deer Park, 1'37 in.; Calvin, 1'60 in.; Credit, 1'12 in.; Midland, 1'37 in.; Norquay, 1'27 in.; Egremont, 1'25 in.; Haliburton, 1'01 in.; Mattawa, 1'30 in.; Georgina, 2'15 in.

20. Denbigh, 1'08 in.; Aurora, 1'28 in.; Brome, 5'25 in.; Bancroft, 1'76 in.; Richmond, 1'19 in.; Digby, 1'00 in.; St. Hyacinthe, 1'26 in.; Paris, 1'02 in.; Rockliffe, 1'77 in.; Grand Manan, 1'37 in.; Ottawa, 1'96 in.; Alexandria, 2'53 in.; Montreal, 2'14 in.

21. Lyons, 1'05 in.; St. Mary's, 1'30 in.; DeCewsville, 1'09 in.; St. George, 1'10 in.; London, 1'59 in.

22. Chicoutimi, 1'62 in.

23. Little Forks, 1'00 in.

24. Blenheim, 2'15 in.

25. Brome, 2'06 in.

27. St. Thomas, 1'80 in.; Watford, 1'00 in.; Fergus, 1'30 in.; Wyoming, 1'15 in.; Coldstream, 1'15 in.; Georgetown, 1'06 in.; Blenheim, 1'26 in.; Dealtown, 1'23 in.; Alton, 1'10 in.; Sault St. Marie, 1'00 in.; Point Clark, 1'10 in.; St. Mary's, 1'36 in.; Birnam, 1'38 in.; Kingsville, 1'43 in.; Shannonville, 1'00 in.; Elora, 1'24 in.; Kingston, 1'14 in.; Port Dover, 1'14 in.; Alexandria, 1'35 in.; London, 1'08 in.

28. Orangeville, 1'40 in.; Bicquet, 1'10 in.; Point des Monts, 1'60 in.; Cartier, 1'05 in.; Dalhousie, 1'40 in.; Sharon, 1'10 in.; Pelee Island, 1'69 in.; Parker's Ridge, 1'13 in.; Quebec, 1'50 in.; St. Andrews, 1'05 in.

29. Channel, 1'10 in.; Wallace, 1'27 in.

30. Princeton, 1'02 in.; Winona, 1'01 in.; Brome, 1'10 in.; Paris, 1'28 in.; Pelee Island, 1'20 in.; Kingston, 1'27 in.; Port Stanley, 1'09 in.; Alexandria, 1'33 in.

Thunder recorded on the following dates :—

1. Uplands, St. Mary's, Bancroft, Egremont, Mount Forest, Blenheim, French Creek, Quamichan, Georgina, Lucknow, Parker's Ridge, Welland, Sombra, Pelee Island, Kingsville, Owen Sound, Peterboro', Cottam, Sharon, Ridgetown, Birnam, Gravenhurst, Stoney Creek, Georgetown, Ont., Barrie, Thedford, Belleville, Scarboro', Cayuga, Coldstream, Wyoming, Wilton Grove, St. Thomas, Lindsay, Alexandria, Bathurst, Ottawa, Toronto, Zurich.

2. Georgina, Welland, Sombra, Pelee Island, Kingsville, Cottam, Sharon, Gravenhurst, Stoney Creek, Brantford, Paris, Dorchester, St. Hyacinthe, Richmond, Bancroft, Egremont, Norwood, Alton, Brome, Elkhorn, Hillview, Fort Ellice, Aurora, Dealtown, Georgetown, Ont., Burk's Falls, Barrie, Scarboro', Wilton Grove, Lennoxville, Lindsay, Alexandria, Truro, Toronto, Zurich.

3. Sombra, Cottam, Dealtown, Wyoming, Truro.

4. Welland, Sombra, Kingsville, Cottam, Ridgetown, Birnam, Elkhorn, Woodstock, Petrolea, Zurich.

5. Novar, Alton, Blenheim, Georgetown, Burk's Falls, Barrie, Scarboro', St. Thomas, Lindsay, Renfrew, Elora, Georgina, Welland, Haliburton, Sombra, Peterboro', Cottam, Sharon, Gravenhurst, Stoney Creek, Brantford, Paris, Joly, St. Hyacinthe, Bancroft, Egremont, London, Ottawa, Toronto,

6. Fort Francis, Richmond, Glenbow, Lennoxville, Petrolea.

7. Barkerville, Sombra, Pelee Island, Brantford, Henrietta, Glenbow.
8. Elora, Lucknow, Sombra, Kingsville, Peterboro', Cottam, Bognor, Uplands, Brantford, Joly, Bancroft, Egremont, Novar, Alton, Henrietta, Elkhorn, Hillview, Fort Ellice, Mount Forest, Glenbow, Brandon, St. Albans, Portage la Prairie, Pembina Crossing, Scarboro', Cayuga, St. Thomas, Wallace, Toronto, Winnipeg, Rapid City, Turtle Mountain, Georgetown, Barrie, Belleville,
9. Lucknow, Welland, Owen Sound, Cottam, Sharon, Ridgetown, St. Mary's, Glen Adelaide, Alton, Brandon, Portage la Prairie, Pembina Crossing, Cartwright, Norquay, Turtle Mountain, Presque'Isle, Georgetown, Burk's Falls, Wilton Grove, St. Thomas, Lindsay, Durham, Zurich.
10. Cottam, Glen Adelaide, Elkhorn, Oakbank, St. Albans, Savanne, Pembina Crossing, Hanlan, Winnipeg, Rapid City, Norquay, Selkirk, Barclay.
11. Fort Francis, Elkhorn, Fort Ellice, Brandon, Savanne, Portage la Prairie, Pembina Crossing, Treherne, Hanlan, Winnipeg, Rapid City, Norquay, Turtle Mountain, Barclay, Wallace.
12. Georgina, Peterboro', Uplands, Point Clark, Glen Adelaide, Richmond, Brome, Pembina Crossing, Barclay, Calvin, Wallace, Little Forks, Alexandria, Ottawa, Chicoutimi.
13. Griffins Lake, Georgina, Parker's Ridge, Whiteside, Pelee Island, Bognor, Sharon, Gravenhurst, Stoney Creek, Uplands, Paris, Beatrice, Kilmahumaig, Dorchester, Bancroft, Egremont, Alton, Mount Forest, Pembina Crossing, Midland, Wiarton, Lion's Head, Barrie, Fredericton, Alexandria, Coldwater, Durham, Toronto.
14. Barkerville, Whiteside, Haliburton, Owen Sound, Bognor, Gravenhurst, Uplands, Beatrice, Kilmahumaig, Dorchester, Georgetown, P.E.I., Joly, Sprucedale, St. Hyacinthe, Bathurst, Coldwater, Truro, Digby, Richmond, Bancroft, Novar, Brome, Point Lepreaux, Whitehead, Pembina Crossing, Winnipeg, Cartwright, Burk's Falls, Wallace, Lennoxville.
15. Brantford, Digby, Glenbow, Channel, Rathwell, Winnipeg, Norquay, Little Forks.
16. Georgina, Ottawa, Welland, Kingsville, Stoney Creek, Brantford, St. Hyacinthe, Alton, Brome, Henrietta, Pembina Crossing, Rosebury, Midland, Lion's Head, Cayuga, Alexandria, Petrolea.
17. Griffins Lake, Barkerville, Georgina, Lucknow, Whiteside, Haliburton, Pelee Island, Kingsville, Owen Sound, Bognor, Sharon, Ridgetown, Birnam, Gravenhurst, Stoney Creek, St. Mary's, Point Clark, Bancroft, Egremont, Henrietta, Elkhorn, Sunshine, Wiarton, Aurora, Presque Isle, Blenheim, Georgetown, Barrie, Thedford, Wyoming, Lindsay, Coldwater, Durham, London.
18. Georgina, Sombra, Kingsville, Cottam, Brantford, Glen Adelaide, Elkhorn, Portage la Prairie, Pembina Crossing, Rathwell, Treherne, Clandeboye, Hanlan, Norquay, Selkirk, Georgetown, Ont., Scarboro', St. Thomas, Wallace, Toronto.
19. Fort Francis, Georgina, Kingsville, Cottam, Sharon, St. Mary's, Glen Adelaide, Egremont, Alton, Clandeboye, Hanlan, Winnipeg, Roseberry, Blenheim, Georgetown, Barrie, Cayuga, Lennoxville, Toronto.
20. Fort Francis, Georgina, Lucknow, Welland, Sombra, Pelee Island, Kingsville, Ridgetown, Brantford, St. Mary's, Alton, Brandon, Portage la Prairie, Rathwell, Norquay, Georgetown, Scarboro', Cayuga, Wyoming, Princeton, St. Thomas, Lennoxville, Alexandria, Petrolea.
21. Welland, Cottam, Birnam, Brantford, St. Mary's, Agassiz, Calvin, Cayuga, Lennoxville, Toronto.
22. Lucknow, Cottam, Ridgetown, Brantford, Brome, Cayuga, Princeton, St. Thomas, Lennoxville.
23. Elora, Lucknow, Pelee Island, Kingsville, Peterboro', Cottam, Birnam, Gravenhurst, Alton, Cartier, Barrie, Belleville, St. Thomas, Lennoxville, Alexandria, Ottawa.
24. Gravenhurst, Uplands, Bancroft, Novar, Channel Island, Blenheim, Burk's Falls, Lennoxville, Alexandria, Ottawa.
25. Gravenhurst, Georgetown, P.E.I., Brome, Channel Island, Pembina Crossing, Lennoxville, Alexandria, Zurich.
26. Pelee Island, Gravenhurst, Brome, Henrietta, Saskatoon, Oakbank, Treherne, Norquay, St. Thomas.
27. Elora, Lucknow, Welland, Sombra, Kingsville, Peterboro', Bognor, Sharon, Birnam, Gravenhurst, St. Mary's, Point Clark, Egremont, Alton, Posen, Channel Island, St. Albans, Pembina Crossing, Treherne, Hanlan, Winnipeg, Roseberry, Rosebank, Presque'Isle, Lion's Head, Belleville, Scarboro', Princeton, Wilton Grove, Wallace, Alexandria, Durham, Petrolea, Ottawa, Toronto, Zurich.

28. Welland, Pelee Island, Kingsville, Cottam, Brandon; Rathwell, Wyoming, Lindsay.
29. Elora, Barkerville, Georgina, Welland, Whiteside, Haliburton, Owen Sound, Cottam, Sharon, Richmond, Egremont, Alton, Brome, Mount Forest, Presqu'Isle, Calvin, Georgetown, Ont., Barrie, Princeton, Toronto, Zurich.
30. Welland, Pelee Island, Peterboro', Richmond, Roseberry, Alexandria.

Frost occurred on—

1. Fort Osborne, Griffins Lake.
2. Saskatoon, Savanne.
4. Glen Adelaide, White River.
5. Truro, Sydney.
6. Fort Ellice.
7. Calvin.
8. Truro.
10. Dorchester, Parker's Ridge.
11. Truro.
13. Truro, Prince Albert, Oonikup.
16. Gretna, Hillview, Hanlan, Norway, *beans cut*, Fort Ellice, St. Albans.
20. Barkerville.
24. Truro.
25. Truro.
26. St. Johns, Nfld.
29. Peterboro', Wallace.
30. Elora, Hillview, *cut potatoes and corn*, Arden, Shoal Lake, Pilot Mound, Bradwardine, Rapid City, *potatoes and tender vegetables cut*, Norquay, *squash and potatoes cut down*, Fort Ellice, *potatoes and all tender stuff killed*, St. Albans, *citrons and beans killed*, Elkhorn, Little Forks, Minnedosa, Brandon, Fort Francis.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1. Savanne, Minnedosa, III.
2. Winnipeg, Savanne, Father Point, III.
3. Fort Francis, I ; Port Arthur, I.
4. Minnedosa, III.
6. Burk's Falls, IV.
12. Esquimalt, IV.
14. Thedford, IV ; Buda, II ; Egremont, II.
15. Pembina Crossing, IV ; Fort Francis.
16. Hillview, Winnipeg, Novar, Dorchester, Gravenhurst, IV ; Alexandria, IV.
18. Pembina Crossing, IV ; Port Arthur, II.
19. Pembina Crossing, IV.
20. Pembina Crossing, III.
21. Pembina Crossing, IV ; Sydney, IV.
22. Alton, II ; Sombra, IV ; Port Arthur, I ; Chicoutimi, IV.
23. Channel Island, IV ; Alton, II ; Gravenhurst, III ; Durham, IV ; Chicoutimi, III.
24. Pembina Crossing, II ; Novar, Egremont, II ; Dorchester, Gravenhurst, IV ; Georgina, Charlottetown, IV ; Durham, IV ; Truro, III ; Toronto, IV.
25. Saugeen, IV ; Sydney, IV.
26. Calvin, I ; Pembina Crossing, IV ; Channel Island, IV ; Chicoutimi, IV.
27. Calvin, I ; Pembina Crossing, IV ; Esquimalt, IV ; Winnipeg, Little Forks.
28. Calvin, I ; Novar, Egremont, III ; Brantford, Minnedosa, III ; Toronto, III.
29. Pembina Crossing, III ; Glenbow, Winnipeg.
30. Calvin, I ; Novar, Georgina, Minnedosa, I ; Durham, III.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF JUNE, 1902.

HOURS ENDING																
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.
ESQUIMALT.....		0 15	0 21	0 40	0 51	0 63	0 64	0 72	0 70	0 71	0 74	0 74	0 77	0 76	0 32	..
AGASSIZ, B.C.....		06	31	41	47	58	62	64	65	55	51	32	27	20	06	..
BRANDON.....	01	44	54	59	65	57	40	40	38	36	47	41	49	55	50	02
INDIAN HEAD.....		28	50	57	57	62	58	57	53	56	53	58	53	59	40	01
WINNIPEG.....	10	51	59	60	74	77	74	72	68	66	68	59	60	57	54	18
KINGSVILLE.....		10	42	53	68	65	63	64	72	73	75	65	59	47	32	..
WOODSTOCK.....		18	52	50	51	62	63	66	64	70	66	62	55	38	29	01
TORONTO.....		19	46	56	56	56	55	53	50	56	62	58	50	48	26	..
LINDSAY.....	03	18	42	47	48	46	50	47	54	63	58	52	47	04	35	24
BARRIE.....		17	39	45	41	42	41	50	53	53	46	27	13	07	8	..
KINGSTON.....		10	31	58	50	61	63	60	57	53	62	59	50	51	53	36
MONTREAL.....	10	21	39	51	36	60	60	52	44	45	41	42	41	41	10	..
FREDERICTON.....	30	22	36	40	58	60	51	50	47	48	47	50	40	40	34	10
SYDNEY.....	22	51	56	62	66	67	70	72	71	75	75	71	64	56	50	22
		ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	KINGSVILLE.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.	
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)	0 43	0 39	0 40	0 44	0 57	0 50	0 48	0 47	0 44	0 35	0 49	0 44	0 41	0 61		
MAXIMUM DAILY AMOUNT.....	0 70	0 89	0 94	0 86	0 91	0 85	0 88	0 89	0 96	0 81	0 93	0 97	0 94	0 99		
DATE	26	27	6-21	6	30	15	12	12	11	4	10	15	7	10		
NO. OF DAYS COMPLETELY CLOUDED.....	2	5	4	4	1	1	1	2	2	8	3	4	7	0		

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m.

The number of predictions issued during the month was 594. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
MANITOBA	101	76	14	11	82 2
LOWER LAKE REGION.....	112	77	22	13	78 6
UPPER ST. LAWRENCE	101	74	16	11	81 2
LOWER ST. LAWRENCE.....	93	72	10	11	82 8
GULF.....	93	67	16	10	80 6
MARITIME PROVINCES	94	68	19	7	82 4
TOTAL	594	434	97	63	81 2

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions the reports from the agents at the "Probability Stations," as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer H. V. Payne.

STORM WARNINGS.

These were no warnings issued during the month of June.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR JUNE, 1892.

Slight disturbances prevailed on the first two days. On the evening of the 2nd an increased activity was shewn lasting a short time. A little before midnight of the same day the movements again increased and during the morning of the 3rd an important storm was registered. The oscillations were rapid, and several swings of the declination magnet between 2 and 4 a.m. amounted to over 1° ; the most marked feature of the storm was the violent oscillations. The h. f. during the afternoon of the 2nd was above its normal value, and after midnight a rapid diminution set in and its lowest reading took place at 2.30 a.m. when a quick recovery began and by 6 a.m. it was about at its normal reading and much steadier. The v. f. component was steadily decreased shortly after 8 p.m. of the 2nd. And previous to the midnight observation the decrease was considerably accelerated and the force remained below its normal value up to 5 a.m. After 6 a.m. the magnets became steady, and continued so until the 16th when a slight disturbance was felt, also on the 17th. On the evening of the 24th a few irregularities were noticed. The 25th and 26th were normal days.

On the 27th quite a disturbance sprang up, it started in suddenly on the force magnets a little before midnight of the 26th, both components being suddenly increased. All morning of the 27th the declination magnet was vibrating considerably, during the early portion of the disturbance the magnet was east of its mean position, still it never deviated very much from the normal but kept oscillating on each side, during the afternoon the changes were very much reduced. At the commencement of the storm the force magnets changed but little. After 2 a.m. a rapid diminution began and by 5.20 a.m. both components had changed over 10052 c.g.s. A recovery then began, but still they remained below their normals until the afternoon. After 4 p.m. there were signs of a renewal of the disturbance, but nothing of importance followed and the disturbance gradually died away. On the morning of the 28th slight disturbance appeared and was visible off and on for the remainder of the month.

Auroral light in N. (Class IV) was observed on the 24th. On the 28th faint auroral light and streamers from 10.30 p.m. On the 6th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 20th, 23rd, 25th, 27th and 30th the sky was clear but no aurora was observed. On all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL

Director.

METEOROLOGICAL OFFICE,
Toronto, August 15th 1892.

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

JULY, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraph reporting stations, was above the normal of eighteen years from Winnipeg eastward, the greatest excess 0.10 in. occurring at Port Stanley; from Minnedosa westward it was below the normal, the greatest defect occurring at Edmonton and Prince Albert, amounting to 0.11 in.

July was chiefly noticeable for the abnormally high temperature which, as a rule, prevailed over the greater portion of the continent, together with the large amount of rain which occurred, for the most part accompanying thunder-storms.

The month began with a depression covering the North-west Territories and States, and with generally high pressure over the remainder of the continent. The weather was showery in the North-west and over the Lower St. Lawrence and Maritime Provinces, and fine in other portions of Canada.

Between the 2nd and 4th the depression traversed Canada to the Atlantic Coast attended by heavy rain and thunder-storms, together with very strong winds in many localities. It was succeeded by a period of high pressure and very fine weather, which lasted from the Lakes to the Atlantic until the 12th, interrupted, however, along the St. Lawrence Valley and in the Bay of Fundy during the night of the 9th, and in the Gulf and Maritime Provinces on the 10th.

In the North-west Territories and Manitoba from the 1st until the 12th, showers and thunder-storms were almost of daily occurrence. The latter were at times locally severe; very strong winds were also experienced frequently, and the temperature throughout was abnormally high.

The passage of a little depression between the 13th and 14th produced a few local showers and thunder-storms from the Lakes to the Atlantic. At the same time another depression caused some local showers and thunder-storms in the North-west Territories and Manitoba.

The North-west depression after reaching Lake Superior, during the night of the 14th, developed considerable energy, and passing over the Lakes and down the St. Lawrence it gave heavy rains and thunder-storms between the 15th and 16th in all localities, and in many places, more especially in the Lake Region and the Lower St. Lawrence Valley, the winds, as they veered to the westward, increased to a moderate or fresh gale.

After a short spell of fine weather attended by pressure as a rule above its average, the movement of a depression from the North-westward, which developed much more energy as it neared the Lower St. Lawrence, caused during the 18th and early portions of the 19th local showers and thunder-storms in Ontario; these became more general between the 18th and 20th in Quebec and the Maritime Provinces, and at the same time the winds increased to a moderate gale from the westward in the Lower St. Lawrence and portions of the Gulf.

The 20th and 21st in Ontario and Quebec, and the latter also in the Maritime Provinces, were fine pleasant days.

The marked period of the month's weather in Ontario and Quebec occurred between the 22nd and the 29th. The distribution of pressure was entirely cyclonic owing to the passage of four shallow depressions in succession over the country to the Atlantic coast. The winds were from a

southerly and westerly direction, and the temperature was very high, maxima ranging between 80° and 90° were experienced daily, and on several occasions nearly 100° was recorded in many places; the showers and thunderstorms which frequently prevailed were at times very heavy and the excessive humidity as a rule prevailing made the heat more severely felt. In the Maritime Provinces showers and thunderstorms were very general during this protracted interval, but the temperature, although as a rule above its average, was not so high as in Ontario and Quebec.

An area of high pressure which was first shown over our Rocky Mountain region on the 26th, passed into the Lake district on the 29th, and spread quickly eastward. It brought clearing and much cooler weather in all localities, attended at first by strong westerly to north-westerly winds, which were principally confined to Ontario and Quebec.

During the last two days of the month the distribution of pressure was anti-cyclonic from the Lakes to the Atlantic, attended by fine pleasant weather.

In the North-west Territories and Manitoba during the last half of the month the distribution of pressure was mainly cyclonic; anti-cyclonic conditions, however, existed on the 15th, the 27th and 28th, and the 30th and 31st. During the period a good deal of rain fell, chiefly attending thunderstorms; it was pretty general on the 15th, between the 17th and 19th, between the 22nd and 24th, and on the 26th, and more local on the 16th, the 21st, the 25th, and between the 29th and 30th. A cool spell set in on the 26th and lasted to a greater or less extent until the 31st, but before this the temperature was generally very high and much above its average. High winds at times were experienced, more especially on the 17th, the 22nd, the 23rd, and on the 26th.

TEMPERATURE.

The average temperature differed little from the normal throughout the Dominion; in the Maritime Provinces it was generally below, and in the Western slightly above.

The highest and lowest Temperatures in each Province during Ju'y were:

British Columbia: 94°·0 on 30th, at Keremeos; 31°·0 on 13th at Barkerville.

North-west Territories: 98°·0 on 5th, at Battleford; 34°·0 on 18th at Calgary.

Manitoba: 95°·6 on 12th, at Brandon; 35°·5 on 28th, at Minedosa.

Ontario: 100°·5 on 10th, at Renfrew; 30°·4 on 2nd, at White River.

Quebec: 95°·2 on 12th, at Lennoxville; 37°·0 on 5th, at Richmond.

New Brunswick: 92°·0 on 13th, at Bathurst; 40°·0 on 18th, at Parker's Ridge.

Nova Scotia: 99°·0 on 29th, at Port Hastings; 38°·0 on 31st, at Pictou.

Prince Edward Island: 91°·5 on 12th, at Georgetown; 45°·1 on 7th, at Kilmahumaig.

Mr. Clark, of Bancroft, Ontario, reports that on the 26th a slight earthquake shock was felt lasting about 10 seconds rumbling noise with oscillation.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION, &c.—Continued.

	PRESSURE IN INCHES.				TEMPERATURE OF AIR.				DIRECTION OF WIND FROM.				VELOCITY OF WIND.				PRECIPITATION.	
	Mean actual.		Mean reduced.		Range.		Mean.		Difference from average.		Years observ.		Highest.		Lowest.		Mean.	
	in.	in.	in.	in.	in.	in.	°	°	°	°	°	°	°	°	°	°	°	°
	in.	in.	in.	in.	in.	in.	°	°	°	°	°	°	°	°	°	°	in.	in.
ONTARIO—Continued.																		
Axe Lake.....	67.4	—	0.3	6.91	25	41.6	1	29.1	39.8	.....	.....	.....
Coldwater.....	63.7	—	0.7	16.84	12	40.0	4	24.1	34.0	.....	.....	.....
Beatrie.....	67.5	—	1.0	8.21	9.0	32	40.0	1	27.5	40.0	.....	.....
Gravelhurst.....	66.1	—	1.8	4.90	5	33	16	.....	.....	.....	.....	.....
North Puce.....	66.1	—	1.8	4.90	5	33	16	.....	.....	.....	.....	.....
Rocklife.....	65.1	—	4.0	15.92	12	36.0	.....	.....	.....	.....	.....	.....
.....	67.3	—	0.1	11.95	25	42.0	17	28.0	39.0	.....	.....	.....
Zurich.....	66.7	—	1.0	19.85	28	51.0	.....	.....	.....	.....	.....	.....
Point Clark.....	68.9	—	1.2	3.91	0	26	11.0	1	21.7	32.0	.....	.....
St. Mary's.....	68.9	—	1.2	3.91	0	26	11.0	1	21.7	32.0	.....	.....
Paris.....	68.9	—	1.2	3.91	0	26	11.0	1	21.7	32.0	.....	.....
Lucknow.....	67.8	—	1.2	6.93	71	26	30.5	1	26.4	38.0	.....	.....
Bognor.....	64.3	—	1.7	2.89	0	11	17.0	4	.....	.....	.....	.....
Barnam.....	68.2	—	1.0	9.93	3	24	12.8	1	23.6	31.3	.....	.....
Cottam.....	71.0	—	2.1	4.97	0	24	54.0	16	.....	.....	.....	.....
Point Pelee.....	74.1	—	0.5	15.92	7	26	54.0	11	18.2	25.0	.....	.....
Kingsville.....	73.2	—	2.5	2.93	5	25	51.0	1	18.1	23.8	.....	.....
Petrolia.....	69.0	—	0.8	6.95	0	26	10.0	1	28.0	35.0	.....	.....
Ridgeway.....	72.8	—	4.7	9.93	0	26	12.5	1	24.1	34.5	.....	.....
Woodstock.....	67.6	—	0.2	18.87	0	26	42.9	1	21.6	29.7	.....	.....
Port Stanley.....	70.0	—	0.3	10.92	0	24	42.0	1	24.2	37.0	.....	.....
Brantford.....	69.0	—	0.6	9.94	4	30	42.0	1	25.6	41.1	.....	.....
St. George.....	68.3	—	0.6	18.86	8	28	44.0	1	17.6	24.7	.....	.....
Port Dover.....	68.0	—	0.5	11.92	4	27	31.7	1	32.1	40.6	.....	.....
Glucha.....	66.4	—	0.2	9.94	0	28	37.0	1	27.5	35.0	.....	.....
Elora.....	69.9	—	2.2	5.98	0	25	45.0	2	24.1	32.0	.....	.....
Welland.....	70.0	—	0.3	7.91	0	26	52.0	3	.....	.....	.....	.....
Niagara Falls, S.....	64.9	—	3.6	3.88	0	10	40.2	1	30.1	37.9	.....	.....
South Ste. Marie.....	68.1	—	0.9	2.90	0	26	52.0	1	.....	.....	.....	.....
DeCewville.....	70.2	—	1.1	5.95	5	26	42.4	1	26.1	33.8	.....	.....
Sombra.....	65.4	—	2.1	5.89	9	12	4	5	30.6	38.8	.....	.....
Markatawa.....	66.4	—	4.7	1.88	0	26	42.0	5	20.1	31.0	.....	.....
Collingwood.....	70.8	—	0.9	8.97	0	28	41.0	1	22.5	28.0	.....	.....
Stony Creek.....	69.7	—	4.0	4.93	0	25	44.5	5	28.7	36.0	.....	.....
Georgina.....	68.1	—	0.5	6.93	3	28	43.7	1	20.1	26.6	.....	.....
Sharon.....	66.2	—	1.0	5.88	2	28	36.5	1	25.3	37.7	.....	.....
Toronto.....	67.9	—	1.7	12.90	7	24	38.1	1	27.3	40.4	.....	.....
Altou.....	65.6	—	1.4	11.94	0	12	31.0	12	23.0	35.0	.....	.....
Lindsay.....	66.9	—	0.5	7.88	0	29	43.0	1	19.2	25.0	.....	.....
Norwood.....	70.2	—	0.9	10.93	0	28	15.5	1	24.8	34.6	.....	.....
Oshawa.....	68.1	—	0.3	18.81	6	26	18.0	4	15.1	24.1	.....	.....
Deseronto.....	68.5	—	0.8	16.96	6	29	14.5	5	24.3	36.6	.....	.....
Kingston.....	69.4	—	1.8	8.88	0	26	13.0	1	16.5	29.0	.....	.....
Ottawa.....	68.7	—	1.4	1.87	7	29	41.2	5	18.5	31.7	.....	.....
Lakefield.....	68.6	—	0.7	7.10	5	10	35.0	5	33.1	45.4	.....	.....
Alexandria.....	71.2	—	0.8	22.97	5	25	40.0	1	25.1	38.1	.....	.....
Renfrew.....	65.6	—	2.6	5.86	2	25	39.0	1	25.1	38.1	.....	.....
Peterborough.....	65.2	—	1.5	4.87	0	11	40.0	1	27.3	40.0	.....	.....
Bancroft.....	66.9	—	2.1	4.89	0	23	33.7	5	27.4	40.8	.....	.....
Haliburton.....	66.9	—	2.1	4.89	0	23	33.7	5	27.4	40.8	.....	.....
Clontarf.....	66.9	—	2.1	4.89	0	23	33.7	5	27.4	40.8	.....	.....

ONTARIO—Continued.

Little Forks.....	62.6	+ 2.1	1 96.0	11	35.0	29	30.7	53.5	60.5	84	3	0	27	0	1	1	13	19	22	10	0	93	u	iv	11 NE	6.20	.....	8.23	4	2	0	
Fort Francis.....	61.3	—	92.3	22	31.0	3	33.4	51.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.50	.....	8.23	2	0	0	
*Shannonville.....	69.8	+ 1.8	3.93.0	28	55.0	1.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.60	+ 0.23	3.58	0	0	0	
QUEBEC:																																	
Montreal.....	29 38 30.52 29.51	1.01	69.8	+ 0.9	18.88.5	29	50.6	17	17.3	26.5	60.0	72	5	0	64	45	14	10	15	30	232	319	0	744	16.1	25.4	22NW	2.95	—1.18	18.13	6	3	3
Picard Bay.....	57.6	—	77.0	8	44.0	23	16.9	30.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.31	—	12.19	1	5	1	
Heath Point.....	53.6	—	1.8	8.67.0	8	41.0	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.67	+ 0.90	3.28	0	0	10	
Chatham.....	66.4	+ 0.4	13.90.5	29	37.0	5	23.0	37.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.76	+ 0.70	.....	.....	.....	.....
Chateaufort.....	64.5	+ 0.0	11.88.1	13	41.8	7	23.1	34.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.65	+ 3.31	9.22	3	1	0	
Quebec.....	65.5	—	0.2	18.81.5	25	42.7	5	19.6	28.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.13	+ 0.03	18.13	8	0	0	
Quebecville.....	68.0	+ 2.3	2.95.2	12	42.7	7	21.3	37.9	50.8	73	4	0	0	2	0	2	2	23	8	1	31	75	.....	.....	4.00	+ 0.50	15.16	5	9	0	
Anticosti, W. P.....	57.7	+ 1.2	9.11.0	9	50.0	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.28	+ 1.67	11.20	0	2	2	
Brome.....	68.1	+ 2.3	13.87.0	29	37.0	5	20.0	31.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.36	+ 0.58	14.17	0	1	0	
*Point des Monts.....	58.2	+ 0.7	18.80.0	14	43.7	24	18.4	31.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.38	+ 0.58	11.20	6	0	1	
*Cape Chatte.....	60.5	+ 0.0	10.80.0	28	50.0	18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.00	+ 0.70	8.23	0	0	5	
*Bequet.....	54.9	+ 0.4	10.75.0	15	52.0	18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.78	+ 0.61	4.27	0	0	4	
*Cape Magdalen.....	61.1	+ 1.4	10.80.0	16	52.0	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.10	+ 0.45	9.22	0	0	11	
St. Hyacinthe.....	69.1	+ 1.4	2.89.0	29	12.0	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.27	+ 0.91	8.23	0	0	1	
NEW BRUNSWICK:																																	
Fredericton.....	29 42 30.41 29.52	0.92	65.9	+ 0.0	19.87.7	12	45.5	7	24.6	32.2	61.6	67	4	1	3	1	5	11	7	25	13	22	6	93	6.9	12.1	17W	3.91	+ 0.83	13.18	2	3	2
Chatham.....	29 41 30.10 29.53	0.87	60.4	+ 1.6	18.91.3	12	44.8	6	21.2	37.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.90	+ 1.67	15.16	0	.....	.....
Bathurst.....	29 38 30.42 29.52	0.90	71.0	+ 1.3	19.92.0	13	11.0	18	24.8	32.0	69.4	82	1	1	0	3	25	0	0	42	6	8	15	93	11	vi	16SW	3.73	+ 0.18	10.21	0	4
St. Andrews.....	29 35 30.11 29.58	0.83	62.7	+ 0.8	12.87.6	26	46.7	17	21.7	33.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.63	+ 2.40	10.21	1	0	0
Grand Manan.....	29 37 30.14 29.38	1.06	63.4	+ 2.1	8.84.6	26	47.5	17	18.4	26.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.06	+ 2.25	9.22	0	0	8
*Point Lepreau.....	57.6	+ 1.4	13.76.0	30	49.0	2.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.90	+ 3.00	5.26	0	2	16
St. John (City).....	60.9	+ 1.2	20.84.0	27	49.0	6	14.0	—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.86	+ 1.99	.....	.....	.....	.....
Dorchester.....	60.7	+ 0.3	4.85.0	27	41.0	6	24.6	37.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.89	+ 1.76	10.21	5	5	9
Dalhousie.....	62.4	+ 0.4	12.91.0	8	11.0	8	24.8	30.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.29	+ 1.07	10.21	0	0	0
Parker's Ridge.....	61.4	+ 0.1	5.87.0	12	40.0	18	21.7	35.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.98	+ 1.28	14.17	0	4	0
NOVA SCOTIA:																																	
Halifax.....	30 01 30.44 29.54	0.80	63.7	+ 0.6	18.86.0	27	48.5	7	21.2	31.2	2.69	+ 1.38	14.17	0	0	4	
Sydney.....	29 37 30.10 29.52	0.78	61.6	+ 2.7	22.88.5	12	43.0	7	21.9	34.5	1.58	+ 2.73	12.19	5	0	0	
Yarmouth.....	30 01 30.45 29.53	0.75	59.6	+ 1.1	12.76.0	15	43.0	21	19.9	24.7	2.54	+ 1.00	12.19	5	0	14	
Pictou.....	29 40 30.46 29.53	0.93	65.3	+ 1.9	19.87.5	12	11.0	29	25.8	39.8	2.69	+ 0.33	14.17	7	3	3	
*Digby.....	67.9	+ 1.3	12.82.0	27	56.0	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.85	+ 0.21	8.23	1	3	1
*Whitby.....	59.8	+ 1.0	8.73.0	30	50.0	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.95	+ 1.01	6.25	0	2	3
Port Hastings.....	66.6	—	39.0	29	44.0	11	20.7	41.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.33	+ 2.32	6.25	0	0	11
Sable Island.....	63.1	+ 1.2	9.76.5	14	54.0	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.22	+ 10.21	.....	.....	.....	.....
NEWFOUNDLAND:																																	
St. John's.....	29 37 30.35 29.52	0.83	60.4	+ 1.1	19.85.0	16	11.0	13	20.9	40.0	2.60	+ 1.35	12.19	0	0	0	
P. E. ISLAND:																																	
Kilmahallig.....	65.1	+ 1.9	14.85.0	14	45.1	7	20.8	29.8	3.63	+ 0.01	11.20	0	8	0	
Georgetown.....	68.1	+ 2.7	2.91.5	12	52.0	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.13	+ 1.05	7.24	5	1	1
Charlottetown.....	66.2	+ 2.6	1.83.1	12	51.5	29	15.0	21.6	2.23	+ 1.33	12.19	2	0	0	
BRITISH COLUMBIA:																																	
Esquimalt.....	30 07 30.45 29.81	0.61	57.0	—	2.9	1.74.2	27	45.7	20	13.8	24.0	51.4	82	5	3	2	0	4	7	110	6	12	0	45	186	8.2	16.0	5	S	.....	.....
Quichuan.....	62.3	+ 1.0	6.90.0	28	39.0	10	30.3	47.0	0.87	+ 0.85	9.22	1	0	0	
Barkerville.....	51.0	+ 3.5	4.81.0	30	31.0	13	24.0	41.0	1.10	+ 0.28	4.27	0	0	0	
Agassiz.....	60.7	+ 2.1	2.90.0	27	38.0	5	20.9	39.0	7.40	+ 4.57	25.6	0	1	0	
Port Moody.....	59.5	+ 1.3	5.81.0	27	41.0	5	20.9	36.0	3.27	+ 2.09	14.17	0	1	0	
Abbotsford.....	60.7	+ 1.9	3.86.0	27	42.0	5	20.5	35.0	2.33	+ 0.84	7.24	0	1	0	
Nanaimo.....																																	

STATIONS RECEIVED TOO LATE FOR THE JUNE REVIEW.

PROVINCE.	STATION.	MEAN	HIGHEST		LOWEST		PRECIPITATION.		AURORA.	THUNDER-STORMS.
		TEMP.	Temp.	Date.	Temp.	Date.	Amount.	Days.		
		°	°		°		in.			
British Columbia	Spencer's Bridge	69.21	101.0	29	42.0	9	0.22	3		
Ontario	Lakefield	65.36	86.5	14	48.0	7	3.73	16		
	Clontarf	61.54	86.3	12	31.7	4.7	4.48	18		1st, 5th, 14th, 23rd, 24th, 26th, 28th and 29th.

PRECIPITATION.

The rainfall has in the North-western and central divisions of Ontario, in Manitoba and British Columbia as a whole exceeded the normal amount; in all other parts of the Dominion a deficit has occurred.

The distribution is as follows :—

In British Columbia, it was 2.84 in., or 1.53 in., above the average.

In the N. W. Territories, it was 2.13 in., or 0.31 in. below 1891.

In Manitoba, it was 3.28 in., or 0.35 in. above the average.

In Ontario West and South-West district, it was 2.54 in., or 0.92 in. below the average. In the North and North-West district, it was 3.20 in., or 0.46 in. above the average. In the Central district it was 3.11 in., or 0.39 in. above the average, and in the East and North-East district it was 2.08 in., or 0.82 in. below the average.

In Quebec, it was 2.58 in., or 1.64 in. below the average.

In New Brunswick, it was 2.88 in., or 1.03 in. below the average.

In Nova Scotia, it was 1.88 in., or 1.68 in. below the average.

In Prince Edward Island, it was 2.34 in., or 1.60 in. below the average.

Rainfall 5 in. and upwards during month :—

British Columbia, Fort Simpson, 6.29 in. ; Barkerville, 7.40 in.

Manitoba, Treherne, 6.59 in. ; Shoal Lake, 5.89 in.

Ontario, Dealtown, 5.04 in. ; Little Forks, 6.20 in.

New Brunswick, Chatham, 5.90 in.

Rainfall 1 inch and upwards in 24 hours :—

2nd, Elora, 1.23 in. ; Alton, 1.28 in.

3rd, Ridgetown, 1.14 in. ; Georgina, 1.08 in. ; Cottam, 1.08 in. ; Shannonville, 1.30 in. ; London, 1.26 in. ; Bromie, 1.60 in. ; Hillview, 1.40 in. ; Pelee Island, 1.71 in. ; Sombra, 1.00 in. ; St. Mary's, 1.15 in. ; Zurich, 1.00 in. ; Parker's Ridge, 2.50 in. ; Stoney Creek, 1.85 in. ; Nelson, 1.34 in. ; Fergus, 1.25 in. ; Oliver's Ferry, 1.20 in. ; Toronto, 1.13 in. ; Port Stanley, 1.07 in. ; Chatham, 1.60 in. ; Kingston, 1.03 in. ; Richmond, 1.08 in. ; Port Dover, 1.53 in. ; Princeton, 1.31 in. ; Dealtown, 1.66 in. ; Coldstream, 1.09 in. ; Cowal, 1.34 in. ; Credit, 1.28 in. ; Wilton Grove, 1.30 in. ; Sarnia, 1.04 in. ; Aurora, 1.12 in. ; Barrie, 1.00 in. ; Georgetown, 1.14 in. ; Cayuga, 1.23 in. ; Deer Park, 1.22 in. ; St. Thomas, 1.20 in. ; Belleville, 1.35 in. ; Wyoming, 1.13 in. ; Port Hope, 1.25 in. ; Kingsville, 1.53 in. ; Lennoxville, 1.45 in. ; Bathurst, 1.70 in.

4th, Kilmahumag, 1.34 in. ; Dalhousie, 1.11 in. ; Chatham, 1.25 in.

7th, Oonikap, 1.55 in. ; Fort Simpson, 2.10 in.

9th, Shoal Lake, 3.82 in. *in 6 hours* ; Morris, 1.24 in. ; Rathwell, 1.37 in.

10th, Treherne, 3.60 in. ; Foxton, 2.05 in. *in 3 hours*.

12th, De Clare, 1.20 in. ; Port Hastings, 1.05 in. ; Guelph, 1.37 in.

13th, Fort Francis, 1.20 in. ; Chatham, 1.00 in.

14th, Brandon, 2.75 in. ; Oak Bank, 1.38 in. ; Arden, 1.36 in. ; Selkirk, 1.35 in. ; Pomeroy, 1.30 in. ; Treherne, 1.25 in. ; Winnipeg, 1.15 in. ; Beaver Creek, 1.10 in. ; Rathwell, 1.50 in. ; Oak River, 1.29 in. ; Elkhorn, 1.83 in. ; Portage la Prairie, 1.57 in. ; Brandon, 2.00 in. *in 1 hour*.

15th, Beatrice, 1'55 in., *1'32 in. fell in 20 minutes* ; Egremont, 1'25 in. *in 1 h. 15* ; Norquay, 1'84 in. ; Rapid City, 1'90 in. *in 30 minutes* ; Gravenhurst, 1'15 in. ; St. Thomas, 1'44 in. ; St. Albans, 1'14 in. ; Durham, 1'00 in.

16th, Glastonbury, 1'00 in. ; Orangeville, 1'14 in.

19th, Durham, 1'00 in.

20th, Dalhousie, 1'01 in.

21st, Shoal Lake, 1'15 in.

22nd, Oakbank, 1'35 in. ; Rosebank, 2'25 in. ; Morris, 1'01 in. ; St. Thomas, 1'34 in. ; Ridgetown, 1'52 in.

23rd, Belmont, 1'14 in. ; Portage la Prairie, 1'31 in. ; Point Escuminac, 1'12 in. ; Brandon, 1'20 in. ; St. Albans, 1'34 in. ; Port Simpson, 1'21 in.

24th, Cape Chatte, 1'30 in. ; Paris, 1'00 in. *in 1 hour* ; Thompson, 1'64 in. ; Cayuga, 1'19 in. ; Wyoming, 1'20 in. ; Mount Forest, 1'00 in.

25th, De Cewsville, 1'16 in. ; Owen Sound, 1'47 in. ; Glastonbury, 1'02 in. ; Aurora, 1'04 in. ; Port Hope, 1'00 in. ; Durham, 1'00 in.

26th, North Bruce, 1'27 in. ; Collingwood, 1'03 in. ; Dealtown, 1'58 in. ; Port Stanley, 1'23 in. ; Saugeen, 1'10 in.

27th, Fort Francis, 1'50 in. ; Sprucedale, 1'15 in. ; Wiarton, 1'40 in. ; Orillia, 1'11 in. ; Presqu'Isle, 1'40 in. ; *1'30 in. fell in one hour*.

28th, Cottam, 1'05 in.

29th, Sprucedale, 1'45 in. ; Oliver's Ferry, 1'48 in. ; Shannonville, 1'00 in. ; Alexandria, 1'10 in. ; Ottawa, 1'27 in.

Thunder recorded on the following dates :

2. Blenheim, Cowal, Kingsville, Oakbank.

3. Oakbank, Pembina Crossing, Rathwell, Pelee Island, Portage la Prairie, Cowal, Nelson, St. Albans, Kingsville.

4. Treherne, Rathwell, Portage la Prairie, Keremeos.

5. Peterboro', Georgetown, Little Forks, Alton, Toronto.

6. Elkhorn.

7. Wallace.

8. Selkirk, Rathwell, Portage la Prairie, Nelson, Princeton, Belleville, Savanne, Alexandria, Ottawa, Richmond, Bancroft.

9. Brandon, Posen, Oakbank, St. Hyacinthe, Rapid City, Selkirk, Rosebank, Treherne, Pembina Crossing, Winnipeg, Rathwell, Fort Ellice, Elkhorn, Henrietta, Portage la Prairie, Saskatoon, Glenbow, Nelson, Barclay, St. Thomas, St. Albans, Savanne, Lennoxville, Alexandria, Little Forks, Oakbank, Fort Ellice, Wallace.

10. Chicoutimi, Brandon, Posen, St. Hyacinthe, Norquay *terrific*, Rapid City *heavy*, Selkirk, Rosebank, Treherne, Pembina Crossing, Winnipeg, Fort Ellice, Portage la Prairie, Georgetown, St. Thomas, Wyoming, St. Albans, Georgina, Lennoxville, Richmond.

11. Brandon, Posen, Egremont, St. Hyacinthe, Norquay, Rosebank, Pembina Crossing, Birnam, Winnipeg, Cartier, St. George, Sombra, Elkhorn, Clontarf, Welland, Portage la Prairie, Stoney Creek, Nelson, Aurora, Barrie, Georgetown, Kingsville, Buda, Niagara Falls S., London, Little Forks, Alton, Durham, Toronto.

12. Agassiz, Beatrice, Egremont, Norquay, Lucknow, Uplands, Whiteside, Sprucedale, French Creek, B.C., Eau Claire, Cayuga, St. Thomas, Georgina, Kingsville, Bathurst, Lindsay, Keremeos, Durham.

13. Brandon, Posen, Hillview, Pembina Crossing, Rathwell, Fort Ellice, Pelee Island, Zurich, Elkhorn, Parker's Ridge, Henrietta, Welland, Portage la Prairie, Kilmahumaig, Birnam, Wiarton, Scarboro', Burk's Falls, St. Albans, Ridgetown, Kingsville, Bathurst, Fort Ellice, Toronto.

14. Brandon, Posen, Oakbank, Rapid City, Selkirk, Hillview, Pembina Crossing, Clontarf, Dorchester, N.B., Portage la Prairie, Saskatoon, Kilmahumaig, Wiarton, Burk's Falls, Cottam, Truro, Little Forks, Point Clark, Fredericton, Oakbank.

15. Posen, Elora, Beatrice, Egremont, Point Clark, Norway, Rapid City, Rosebank, Hillview, Treherne, Pembina Crossing, *hail*, Rathwell, Fort Ellice, Cartier, Sombra, St. Mary's, Lucknow, Zurich, Brantford, Haliburton, Peterboro', Clontarf, Uplands, Whiteside, Welland, Sprucedale, Owen Sound, Portage la Prairie, Saskatoon, Paris, Stoney Creek, Birnam, Glenbow, Thedford, Cowal, *terrific* Nelson, Wilton Grove, Orillia, Midland, Aurora, St. Thomas, Scarboro', Lion's Head, *terrible storm*,

Wyoming, Presque Isle, St. Albans, Mattawa, Bognor, Sable Island, Lennoxville, Truro, Coldwater, Deseronto, Ottawa, London, Lindsay, Alton, Bancroft, Durham, Fort Ellice, Toronto, Eau Claire, Cayuga, Belleville, *terrific winds*, Georgina.

16. St. Hyacinthe, Norquay, Zurich, Henrietta, Saskatoon, Glenbow, Lennoxville.

17. Brandon, Posen, Rapid City, Rosebank, Hillview, Treherne, Pembina Crossing, Rathwell, Fort Ellice, Zurich, Portage la Prairie, Kilmahumaig, St. Albans, Barkerville, Fort Ellice.

18. St. Hyacinthe, Norquay, Portage la Prairie, Kilmahumaig, Eau Claire, Lennoxville.

19. Brandon, Posen, Hillview, Winnipeg, Sombra, Portage la Prairie, Saskatoon, Lennoxville, Alexandria, Ottawa, Fort Ellice, Toronto.

20. Oakbank, Norway, Winnipeg, Rathwell, Glen Adelaide, Portage la Prairie, Wallace.

21. Norquay, Glen Adelaide, Sombra, Elkhorn, Henrietta, Saskatoon, Eau Claire, Savanne, Point Clark, Wallace.

22. Brandon, Posen, Point Clark, St. Hyacinthe, Morden, Rapid City, Selkirk, Rosebank, Hillview, Treherne, Pembina Crossing (2.), Fort Ellice, Glen Adelaide, Elkhorn, Brantford, Henrietta, Clontarf, Welland, Portage la Prairie, Saskatoon, Paris, Kilmahumaig, Stoney Creek, Birnam, Nelson, Thedford, Dealtown, Cowal, Eau Claire, Barclay, St. Thomas, Scarboro', *heavy hail*, Belleville, *large hail*, St. Albans, Ridgetown, Kingsville, Cottam, Buda, Lennoxville, Alexandria, Deseronto, Ottawa, Richmond, Bancroft, Fort Ellice, Toronto, Wallace.

23. Pictou, Digby, Point Lepreaux, Point Clark, Norquay, *violent*, Treherne, Winnipeg, Carman, Rathwell, Zurich, Peterboro', Parker's Ridge, Clontarf, Dorchester, N.B., Orillia, Portage la Prairie, Kilmahumaig, Channel, N.F.L., Midland, St. Thomas, Burk's Falls, Belleville, St. John, Niagara Falls S., Sable Island, Bathurst, Truro, Little Forks, Point Clark, Fredericton, Richmond.

24. Point Lepreaux, Beatrice, Egremont, Point Clark, St. Hyacinthe, Norquay, Cartier, Uplands, Pelee Island, Sombra, St. Mary's, Lucknow, Zurich, Brantford, Peterboro', Clontarf, Dorchester, Welland, Sprucedale, Kilmahumaig, Birnam, Wiarton, Thedford, Alton, Barrie, Georgetown, St. Thomas, Lion's Head, Wyoming, Mount Forest, Presque Isle, Princeton, Thompson, Nelson, Eau Claire, *tremendous strong wind*, Aurora, St. John, Georgina, Kingsville, Mattawa, Bognor, Niagara Falls S., Bathurst, Alexandria, Coldwater, Deseronto, Ottawa, Lindsay, Point Clark, Fredericton, Richmond, Bancroft, Durham, Toronto.

25. Pictou, Posen, Norwood, Beatrice, Egremont, Point Clark, Sombra, St. Mary's, Lucknow, Brantford, Parker's Ridge, Whiteside, Dorchester, N.B., Welland, Owen Sound, *hurricane*, Orillia, Portage la Prairie, Paris, Stoney Creek, *fearful squall 7.20 p.m.*, Wiarton, Barrie, Georgetown, Burk's Falls, Belleville, Lion's Head, Presque Isle, Ridgetown, Oliver's Ferry, Princeton, Midland, Aurora, Scarboro', St. Albans, Georgina, Kingsville, Cottam, Bognor, Niagara Falls S., Sable Island, Lennoxville, Truro, Alexandria, Coldwater, Deseronto, Ottawa, Lindsay, Point Clark, Alton, Bancroft, Durham, Toronto, Guelph.

26. Pictou, Digby, Brandon, Egremont, Oakbank, Point Clark, St. Hyacinthe, Blenheim, Sombra, St. Mary's, Peterboro', Parker's Ridge, Clontarf, Dorchester, N.B., Sprucedale, Portage la Prairie, Kilmahumaig, Birnam, Dealtown, Cowal, Barrie, Georgetown, St. Thomas, Scarboro', Belleville, Wyoming, Presque Isle, St. Albans, Kingsville, Cottam, Bognor, Truro, Point Clark, Alton, Durham.

27. Beatrice, Brome, Pelee Island, Sombra, Peterboro', Uplands, Whiteside, Welland, Sprucedale, Owen Sound, Orillia, Paris, Stoney Creek, Nelson, Princeton, Aurora, Barrie, Georgetown, St. Thomas, Scarboro', Burk's Falls, Lion's Head, Georgina, Kingsville, Bognor, Coldwater, Lindsay, Little Forks, Alton, Bancroft, Durham, Toronto, Guelph.

28. Sombra, Peterboro', Clontarf, Welland, Owen Sound, Portage la Prairie, Stoney Creek, Barrie, Georgetown, Scarboro', Belleville, Georgina, Cottam, Bognor, Alton, Toronto.

29. Egremont, St. Hyacinthe, Hillview, Pembina Crossing, Blenheim, Pelee Island, Sombra, Lucknow, Clontarf, Saskatoon, Nelson, Wiarton, Oliver's Ferry, Dealtown, Cowal, Midland, Barrie, Georgetown, Cayuga, St. Thomas, Kingsville, Cottam, Bognor, Deseronto, Ottawa, Bancroft, Durham, Fort Ellice, Toronto.

30. Hillview, Elkhorn, Portage la Prairie, Niagara Falls S., Sable Island, Little Forks.

31. Portage la Prairie.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1. Rapid City, Hillview, Buda, III; Alexandria, II.

2. Posen, II ; Buda, IV.
3. St. George, Esquimalt, IV.
6. Little Forks, IV.
7. Pembina Crossing, III ; Elkhorn, III.
8. Little Forks, III ; Minnedosa, IV ; Wallace, III.
10. Savanne.
12. Posen, I ; Pembina Crossing, Elkhorn, III ; Henrietta, I ; Dorchester, N. B., Georgetown, P. E. I., St. Albans, Savanne, Truro, III ; Alexandria, I ; Deseronto, I ; Point Clark, II ; Wallace, IV.
13. Chicoutimi, IV ; Elora, *bright* ; Beatrice, IV ; Egremont, III ; Point Clark, II ; Hillview, St. George, Sombra, II ; Brantford, II ; Peterboro', I ; Clontarf, III ; Fort Francis, I ; Sprucedale, Georgetown, P.E.I., Stoney Creek, II ; Brnam, III ; Thedford, I ; Nelson, III ; Eau Claire, I ; Barrie, Georgetown, III ; Cayuga, II ; Burk's Falls, III ; Ridgetown, Georgina, Kingsville, IV ; Savanne, Buda, III ; Bognor, Lennoxville, IV ; Ottawa, IV ; Egremont, III ; Port Stanley, II ; Parry Sound, II ; Prince Albert, IV ; Saugeen, II ; Port Arthur, I ; Father Point, II ; Yarmouth, IV ; Bancroft, II ; Durham, II ; Toronto, II.
14. Hillview, St. George, Fort Francis, II ; Sprucedale, St. Albans, Coldwater, IV ; Port Arthur, II.
15. Hillview, St. George, Henrietta, III ; Sprucedale, London, I ; Wallace, IV ; Alton, II.
16. Lennoxville, Truro, II ; Alexandria, I ; Coldwater, IV ; Deseronto, I ; London, I ; Chicoutimi, IV ; Elora, *bright* ; Beatrice, I ; Egremont, I ; Point Clark, IV ; Pembina Crossing, II ; Blenheim, *very brilliant* ; St. George, Sombra, I ; Elkhorn, I ; Brantford, I ; Haliburton, II ; Quebec, II ; Father Point, III ; Charlottetown, IV ; Yarmouth, III ; Fredericton, I ; Alton, II ; Durham, I ; Fort Ellice, Toronto, I ; Wallace, III ; Ottawa, IV ; Lindsay, I ; Egremont, I ; Point Clark, II ; Port Stanley, II ; Parry Sound, I ; Peterboro', II ; Henrietta, III ; Joly, Dorchester, N. B., *brilliant* ; Welland, *beautiful* ; Sprucedale, *wonderful display* ; Portage la Prairie, II ; Georgetown, P.E.I., Paris, I ; Stoney Creek, I ; Buda, III ; Thedford, I ; Nelson, III ; Midland, *brilliant* ; Eau Claire, I ; Barrie, *grand* ; Georgetown, I ; Cayuga, I, *magnificent* ; St. Thomas, II ; Burk's Falls, I ; St. Albans, Georgina, Savanne.
17. Posen, III ; Elora, Rapid City, *grand* ; Hillview, Pembina Crossing, II ; Sprucedale, Kingsville, I ; Bognor, Truro, IV ; White River, I ; Port Arthur, I ; Yarmouth, III ; Bancroft, II.
18. Pictou, Elora, Hillview, Glen Adelaide, Elkhorn, III ; Sprucedale, Savanne, Yarmouth, IV ; Sydney, III.
19. Elora, Pembina Crossing, IV ; Sprucedale, Portage la Prairie, Port Stanley, IV ; Parry Sound, IV.
20. Egremont, III ; Port Stanley, IV ; Burk's Falls, II ; Georgina, Lennoxville, II ; Alexandria, I ; Coldwater, IV ; Deseronto, IV ; Elora, *bright* ; Beatrice, IV ; Egremont, III ; Rapid City, Sombra, III ; Haliburton, III ; Clontarf, IV ; Dorchester, N. B., Sprucedale, Portage la Prairie, Georgetown, P.E.I., Stoney Creek, II ; Georgetown, Ont., Quebec, II ; Father Point, II ; Charlottetown, IV ; Yarmouth, IV ; St. Andrews, IV ; Fredericton, III ; Alton, III ; Richmond, II ; Toronto, IV.
21. Dorchester, N. B., Sprucedale, St. Albans, Savanne, Lennoxville, III ; Minnedosa, IV ; Yarmouth, IV ; Sydney, III ; Alton, III.
22. Chicoutimi, IV ; Haliburton, Sprucedale, White River, III ; Alton, II.
23. Chicoutimi, IV ; Pembina Crossing, IV ; Sprucedale, Belleville, Savanne.
24. Chicoutimi, IV ; Elkhorn, IV ; Haliburton, Stoney Creek, IV ; Burk's Falls, IV ; St. Albans, Savanne, Lindsay, IV ; Port Arthur, III.
25. Rapid City, Hillview, Pembina Crossing, II ; Elkhorn, III ; Haliburton, Joly, Buda, III ; Georgetown, III ; Cayuga, II ; St. Albans, Ridgetown, Savanne, Little Forks, III ; Quebec, III ; Sydney, III ; Bancroft, I.
26. Rapid City, Pembina Crossing, IV ; Cape Chatte, I ; Dorchester, N. B., Georgetown, P.E.I., Eau Claire, II ; Lennoxville, IV ; Truro, IV ; Alexandria, III ; London, IV ; Prince Albert, II ; Quebec, III ; Father Point, II.
27. Pembina Crossing, IV ; Elkhorn, II ; Dorchester, N. B., Cayuga, I ; Savanne, Truro, III ; White River, IV ; Port Arthur, II ; Quebec, III ; Father Point, III ; Sydney, III.
28. Alexandria, Little Forks, III ; Prince Albert, I ; Posen, II ; Hillview, Pembina Crossing, IV ; Cape Chatte, I ; Elkhorn, II ; Haliburton, Dorchester, N. B., Georgetown, P. E. I., Eau Claire, IV ; Kingsville, IV ; Savanne, Truro, IV ; Quebec, IV ; Father Point, IV ; Sydney, III ; Toronto, IV ; Wallace, IV.

29. Pembina Crossing, III ; Dorchester, N. B., Eau Claire, III ; Savanne, Buda, II ; Alexandria, Quebec, IV.
30. Pembina Crossing, IV ; Dorchester, N. B., Eau Claire, IV ; Buda, III ; Truro, IV ; White River, IV ; Port Arthur, III ; Quebec, IV.
31. Posen, IV ; Dorchester, N. B., Buda, II ; White River, I.
Frost occurred on—
1. Bancroft, Egremont, Cartier, Flora, Georgetown, Ont.
3. Cartier.
4. Beatrice *clover cut*, Cartier.
27. Fort Ellice, *cucumbers killed, potatoes slightly frozen*.
28. Greenwood.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF JULY, 1892.

	HOURS ENDING															
	5	6	7	8	9	10	11	NOON	1	2	3	4	5	6	7	8
	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	NOON	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
ESQUIMALT		0 15	0 36	0 34	0 55	0 57	0 60	0 64	0 71	0 69	0 64	0 67	0 72	0 65	0 33	
AGASSIZ, B.C.		06	29	43	43	46	42	45	52	59	54	56	49	46	18	
BRANDON.....		14	53	68	67	83	76	78	77	78	76	79	72	70	59	0 03
INDIAN HEAD.....		35	55	67	70	89	81	81	76	77	81	76	71	72	63	0 07
WINNIPEG.....	10	70	74	78	78	82	82	81	78	73	72	73	65	64	49	0 04
KINGSVILLE		11	61	73	73	76	75	75	73	71	76	73	70	65	33	
WOODSTOCK		31	77	79	83	84	87	87	80	77	75	75	72	70	53	0 04
TORONTO.....		47	74	75	82	82	84	87	80	74	75	75	73	67	37	
LINDSAY.....	8	58	70	71	81	87	85	89	83	76	79	71	67	67	58	0 37
BARRIE.....		04	42	72	72	78	77	82	76	80	81	85	79	76	67	
KINGSTON	8	43	76	77	80	85	86	88	84	81	75	65	64	56	33	8
.....																
MONTREAL.....		37	64	68	73	76	84	87	84	79	66	63	56	53	17	
FREDERICTON	8	39	54	63	68	74	76	82	80	75	69	65	66	62	55	0 11
SYDNEY	10	52	62	68	75	79	84	80	72	67	67	57	60	64	56	0 08
.....																
			ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	KINGSVILLE.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH		0 49	0 37	0 63	0 63	0 66	0 59	0 68	0 67	0 70	0 61	0 65	0 68	0 62	0 63	
(Constant sunshine being 1.)																
MAXIMUM DAILY AMOUNT.....		0 82	0 83	0 84	0 88	0 92	0 86	0 90	0 90	0 96	0 86	0 93	1 00	0 96	0 97	
DATE		19-22	29	29	31	29	31	30	29	28	20	20	20	28	8	
NO. OF DAYS COMPLETELY CLOUDED.....		3	7	1	0	1	2	1	1	1	1	2	1	1	0	

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 688. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
MANITOBA	91	71	19	10	83 5
LOWER LAKE REGION	123	109	15	8	87 4
UPPER ST. LAWRENCE	116	101	9	6	90 9
LOWER ST. LAWRENCE	121	94	21	6	86 4
GULF	117	94	12	11	85 5
MARITIME PROVINCES	129	104	19	6	90 8
TOTAL	688	564	77	47	87 6

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions the reports from the agents at the "Probability Stations," as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer B. C. Webber.

STORM WARNINGS.

During the month warnings on the approach of one storm were issued to our agents and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 10, all of which were verified both with regard to force and with regard to direction.

No. 1. At 3.35 p.m. 15th, owing to a developing depression moving eastward across the Lake Region, signal No. 2 for a moderate south-west veering to west and north-west gale was ordered for stations in the northern portion of the Gulf of St. Lawrence. At 7 a.m. 16th a south-west gale began at Father Point and increased in force during the day, blowing at 50 miles per hour at 5 p.m.; at Percé a moderate south-west gale began at 4 a.m. and continued during the greater part of the day; at other stations strong winds prevailed. Signals were lowered during the evening of the 16th.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR JULY, 1892.

A slight disturbance was felt on the 1st. During the night hours the movements increased for a short time. This disturbance continued up to the morning of the 4th. A quiet period then followed, lasting four days. On the 9th the magnets became a little unsteady and a slight disturbance was recorded up to the afternoon of the 12th when it became more important. After 6 p.m. the magnets were much quieter, but after 2 a.m. of the 13th rapid oscillations began and were maintained all morning. The declination magnet varied but little from its normal reading. The forces shew a larger range. Both components were above the normal during the afternoon of the 12th, and below the next morning. The h. f. was the most affected, the needle shewing some rapid changes about 5 p.m. of the 12th. On the night of the 13th a reappearance of the disturbance was shewn between 10 p.m. and 2 a.m. There were, however, no very large changes. A slight disturbance was registered on the evening of the 14th, and a larger one on the 16th. This disturbance set in after 6 a.m., and during the afternoon there were recorded some exceedingly rapid oscillations. About 8 p.m. the disturbance became more active and was particularly so between 10 and 11 p.m., some rapid changes of the three elements being then recorded. Frequently the declination magnet would alter 2° in a short time and changes of .0169 C. G.—of the vertical component in twenty minutes of time was shewn at 10.20 p.m. Oscillations continued to 2 a.m. of the 17th when the magnets became quieter, but at 5.45 a.m. the storm shewed signs of increased activity lasting about an hour. The declination magnet was east of its mean position up to 11.15 p.m. when a large westerly sweep began. After 6.30 a.m. a steady increase of the v. f. set in, lasting until 4 p.m., and between 10 a.m. and 2 p.m. rapid oscillations of all magnets were going on. After the latter hour the disturbance passed off but slight waves were occasionally shewn up to the 19th. Nothing of importance was recorded until 9.10 p.m. of the 20th when a sharp little disturbance sprung up, the declination magnet suddenly moving east $50'$. It lasted only for a short time and ceased almost as suddenly as it began. At the midnight observation all magnets were fairly steady. From 1 to 2.30 p.m. of the 21st minor changes were going on. These were followed by a very steady curve up to 7 p.m., when a small disturbance commenced and continued until next afternoon. Movements of a similar nature were shewn on the 24th and morning of the 25th. About 7 p.m. of this day the disturbance became more important, and at 8 p.m. the declination magnet was on an easterly swing of $38'$. Several swings of a similar amount took place up to 10 p.m. After 11 p.m. the magnet moved west and at 11.40 p.m. an easterly swing of $57'$ began, reaching its minimum reading at 2.20 p.m. Several westerly swings brought it to its maximum reading at 5 a.m. The total range was $1^{\circ} 5'$. Both components of the force were changing rapidly on the morning and afternoon of the 26th, and slight disturbances were visible up to the end of the month.

Auroral light was visible on the 13th, arch and bright streamers stretching from the N.W. to S.E. Shortly after midnight there was a grand display of aurora, wave after wave of light flashed to the zenith, when a corona was repeatedly formed. Occasionally the streamers were tinged with a deep red colour. On the 16th from 10.15 to 11 p.m., magnificent display of aurora, the whole sky was covered with auroral light and streamers. The pulsations and flashes from the south were very rapid; the corona was perfect. Some of the streamers in N.W. and N.E. were

beautifully coloured. On the 20th faint auroral light in N.E. On the 25th auroral light and patches in the east at 10.15 p.m. On the 28th faint auroral light in N.

The nights of the 1st, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 14th, 17th, 19th, 21st, 22nd, 23rd, 29th, 30th and 31st were clear but no aurora was observed. On all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL

Director.

METEOROLOGICAL OFFICE,

Toronto, September, 15th 1892.

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

AUGUST, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraphic reporting stations was above the normal of eighteen years in the neighbourhood of the Gulf of St. Lawrence. Elsewhere it was about normal, except at Edmonton, N. W. T., where it was '09 below the normal of nine years.

During the first six days of the month several shallow depressions passed across various parts of Canada, keeping the pressure on the whole below average and the weather rather unsettled. A heavy rain prevailed over the greater part of the Maritime Provinces on the 2nd, and on several days thunderstorms occurred at many points in the Dominion, especially in Ontario during the nights of the 1st and 3rd and on the 5th, and in Manitoba early on the 6th. As regards temperature it was about average, except in the North-West Territories where it was unusually warm, particularly on the 1st and 3rd when temperatures of 96° and upwards were recorded in Assiniboia and Alberta.

The following week ending Saturday the 13th was more unsettled in all parts of the country, in Manitoba and the North-West Territories more especially during the first few days, in the Lake Region during the middle, and in the Gulf and Maritime Provinces towards the end of the week. A depression moved south and east from the Territories on Sunday 7th, and somewhat higher pressure with cooler weather and very numerous showers and thunderstorms prevailed until Tuesday; after this for the remainder of the week, although another depression spread over the country, the weather was generally fine and warm, and the only rain occurred during some thunder storms on Friday in Manitoba. During Tuesday low pressure prevailed from the Lakes to the Maritime Provinces; in Ontario the weather was hot and muggy with numerous local thunderstorms, and in Quebec with lower temperature it was unsettled and showery. During the next two days in the Lake Region the weather continued hot and thundery, while an increasing pressure over Northern Quebec and Labrador and a gradual transference of the centre of depression east from the Lakes caused a steepening north east barometric gradient over the lower St. Lawrence and Gulf which was most pronounced during the early part of Saturday. Rain with strong north-east to east winds began very generally in Quebec and northern New Brunswick on the Wednesday and continued during Thursday, Friday and Saturday, and on the two last named days the wind reached the force of a heavy gale. A rain storm prevailed very generally in Nova Scotia and southern New Brunswick on the Friday and Saturday, but the storm was not as severe as further north. The last two days of the week were fine and comparatively cool in Ontario.

The next week beginning the 14th opened a thundery period in Manitoba and the North-West which lasted for five days, the first two of which were very warm and the last two comparatively cool, this was caused by a depression which moved slowly south and east and was succeeded by an area of high pressure, which filled in behind it on the Tuesday and Wednesday bringing northerly winds. At some points the thunderstorms were very severe and unusually heavy rain fell. This same depression caused a moderate gale with thunderstorms on Lake Superior on the 18th, and then moved quickly east with diminishing energy.

Unsettled and rainy weather continued in the Gulf district during the Sunday and in the eastern part of the Maritime Provinces until Monday evening, then it cleared up. Thunderstorms again occurred in the Gulf during the night of the 17th and also on the 19th.

In Ontario and the greater part of Quebec the whole week was fine, with the temperature for the most part somewhat above the average up to Thursday, and below the average on the two following days. The only rain reported was a few scattered showers on the Friday.

During Friday night and early Saturday morning a hurricane passed northeastward between the American coast and the Bermudas, causing a furious gale on these islands. The barometer fell slowly during Saturday in Nova Scotia, with moderate easterly winds and occasional light rain, then on Sunday the weather improved somewhat in the western part of the Province while in Cape Breton rain continued and a heavy north-east gale prevailed along the coast at night. Reports show that the storm centre passed to the south and east of Sable Island and thence across Placentia Bay, Newfoundland.

Between the 22nd and the end of the month there are only two cyclonic movements to be chronicled, the first affecting more especially the Lower Lake region and southern part of the Maritime Provinces, and the other the Northwest Territories and Manitoba and the Lake Region generally, but more particularly Lake Superior.

While high pressure covered Canada from the Lake Region to the Atlantic on the 23rd there was a gradual decrease in the pressure over the Southwest States; this continued on the 24th and extended to the Lower Lake region, where the weather became showery. During the night of the 24th the storm centre passed across Lake Erie and very heavy rain fell throughout Ontario, particularly near Kingston, where at some points the fall exceeded three inches. Passing slowly east and south-east it caused showery weather near the Bay of Fundy on the 25th, and afterwards a more general rain along the Nova Scotian coast on the 27th and 28th. In Ontario the weather did not completely clear up until the 27th. The other depression was moving into the Northwest Territories on the 23rd. On the night of the 24th it caused some local showers, and next day there was a change to cooler weather in Alberta as the centre passed east, and the wind in that Territory veered to west and north-west. On the 26th and 27th the cooler, showery weather extended pretty well all over the Territories and Manitoba. On the last mentioned date the low area seems to have been absorbed by another moving from the south-west towards Dakota, and on the 28th a trough of low pressure extended southward from Manitoba, the weather clearing in the Territories but continuing showery in Manitoba. On the 29th the weather cleared in Manitoba, and as the low pressure moved eastward it gradually focused into a well defined storm centre, which, on the morning of the 30th was over Lake Superior, and a heavy gale prevailed on that lake accompanied by very heavy rain. Passing eastward with diminishing energy it caused heavy local rains and thunderstorms in Ontario during the 30th, and showery weather in Quebec and parts of the Maritime Provinces next day.

TEMPERATURE.

The average temperature as determined from observations taken at telegraphic reporting stations was above the normal in Manitoba and in the greater portions of Ontario and Nova Scotia. Elsewhere it was mostly a little below normal.

The highest and lowest Temperatures in each Province during August were:

British Columbia, 93°·0 on 8th and 9th at Spencer Bridge; 31°·0 on 21st at Fort Simpson.

North-west Territories, 102°·0 on 1st at Regina; 35°·0 on 29th at Oonikup.

Manitoba, 94°·0 on 6th and 14th at St. Albans; 29°·0 on 30th at St. Albans.

Ontario, 97°·0 on 9th at Stoney Creek; 27°·0 on 31st at Little Forks.

Quebec, 87°·0 on 18th and 19th at St. Hyacinthe; 37°·0 on 7th at Anticosti, W.P.

New Brunswick, 86°·4 on 4th at Chatham; 37°·0 on 27th at Dorchester.

Nova Scotia, 85°·0 on 5th at Truro and Pictou; 42°·0 on 27th at Port Hastings.

Prince Edward Island, 82°·5 on 5th at Georgetown; 42°·5 on 23rd at Kilmahumraig.

OMITTED FROM JULY REVIEW.—Gravenhurst: Aurora's on 13th II, *grand display*; 16th I, *splendid display*; 20th II; 24th IV. Thunder storms on 13th, 15th *heavy*. 25th *with heavy squall of wind*; 27th, 28th; Charlottetown, mean velocity, 6·6 miles; number of hours wind, N. 20, N. E. 11, E. 2, S. E. 11, S. 98, S. W. 340, W. 31, N. W. 64, calms, 167.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, AUGUST, 1892.

[illegible]

ONTARIO—*Concluded.*

Novar.....	34-4	20	24-4 38-3	5	1	6	9	0	2	2	13	4	7	44	87	0	33	0	31SW	6-05	+2-01 17 14	3	6
Little Forks.....	53-4	+ 2-4	19-12	27-0	31	37-7 55-0	58-0	89	5	1	10	0	0	3	17	28	18	17	0	6	33	0	
Fort Francis.....	58-0	—	—	86-1	17	36-0 55-1	—	—	—	—	—	—	—	—	—	—	—	—	—	13 18	0	0	
Shannonville.....	67-1	+ 1-4	3 88-0	18	55-0	31	—	—	—	—	—	—	—	—	—	—	—	—	—	0-63	6-25	0	
QUEBEC																							
Montreal.....	29 37 30-28 29-70	0-58	66-4	—	0-5	18 86-2 19-1	51-2	28	15-7 26-9	63-4	78	6	1	109	105	37	47	45	70 161 165	2	744	13-3	32-1
St. Hyacinthe.....	.....	.....	67-0	—	0-6	2 87-0 10-19	41-0	20-28	19-8 31-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anticosti, W. P.....	.....	.....	57-9	—	0-4	10 23-0	31	37-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond.....	.....	.....	64-6	+	1-5	15 87-1	10	39-4	29 21-3 38-1	.....	.....	6	2	1	2	12	9	25	8	4	32	0
Chicoutimi.....	.....	.....	63-5	—	3-5	8 81-8	20	41-1	23 21-2 30-9	.....	.....	6	1	7	13	5	0	6	1	0	46	0
Quebec.....	29-98 30 30 29-71	0-59	61-8	—	1-7	18 53-7	19	45-0	7 17-0 28-2	.....	.....	6	8	7	3	3	3	9	0	15	7	9
Levesville.....	30-61 30-47 29-70	0-77	63-0	—	2-1	2 87-7	18	41-9	23 19-5 30-2	.....	.....	6	7	1	2	41	0	0	1	0	46	0
Anticosti, E. P.....	.....	.....	60-1	—	3-2	8 65-0	20	50-0	7 17-0 28-2	.....	.....	6	7	1	2	41	0	0	1	0	46	0
Brome.....	.....	.....	63-4	—	0-8	11 85-0 10-19	39-0	23	18-2 33-0	.....	.....	6	7	1	2	41	0	0	1	0	46	0
Father Point.....	.....	.....	55-2	—	0-5	17 82-0	19	35-0	27 17-4 34-6	.....	.....	6	7	1	2	41	0	0	1	0	46	0
Point des Monts.....	.....	.....	62-3	—	3-6	8 80-0	1	45-0	28 17-0 28-2	.....	.....	6	7	1	2	41	0	0	1	0	46	0
Cape Chatie.....	.....	.....	56-5	—	1-9	10 77-0	19	41-0	13 17-0 28-2	.....	.....	6	7	1	2	41	0	0	1	0	46	0
Beque.....	.....	.....	52-3	—	0-0	9 65-0	19	42-0	28 17-0 28-2	.....	.....	6	7	1	2	41	0	0	1	0	46	0
Cape Magdalen.....	.....	.....	58-2	—	0-5	10 75-2 16-19	44-0	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plasir Bay.....	.....	.....	55-7	—	—	17-0	31	37-0 24-29	19-6 32-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NEW BRUNSWICK																							
Fredericton.....	30-00 31-31 29-39	0-63	63-7	—	0-3	19 85-2	17	42-0	21-27 18-4 30-8	58-0	78	6	9	6	19	12	4	13	11	11	12	5	
Chatham.....	29 30 31-31 29-69	0-65	63-5	—	0-1	18 86-1	1	43-0	27 17-4 32-8	.....	.....	6	8	1	8	8	1	1	9	15	5	11
St. Andrews.....	29-98 30-28 29-68	0-60	61-8	—	0-3	18 83-6	17	45-2	27 17-6 27-9	.....	.....	6	7	2	11	1	9	6	2	0	6	25
Grand Manan.....	30-00 30-30 29-71	0-56	61-8	—	0-2	9 82-6	17	48-5	27 12-9 21-6	.....	.....	7	9	4	3	10	6	5	12	9	7	62
Point Lepreau.....	.....	.....	59-3	—	2-2	17 79-0	16	53-0	27 12-9 21-6	.....	.....	7	9	4	11	20	10	2	17	6	11	0
St. John.....	30-01 30 31 29-76	0-58	62-4	—	1-5	9 79-3	16	44-3	27 12-8 21-4	58-7	87	7	10	1	41	9	47	27	16	0	18	27	
St. John (City).....	30-00 30-30 29-75	0-55	61-8	—	1-1	32 79-0	16	45-0	27 11-9	.....	89	7	—	.....	.....	.....	.....	.....	.....	.....	.....
Dorchester.....	.....	.....	59-8	—	1-7	4 81-0 10-13	37-0	27	19-1 32-0	.....	.....	4	10	0	0	9	0	0	0	21	0	32
Dalhousie.....	.....	.....	61-9	—	1-4	20 84-5	30	12	23 20-3 32-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Parker's Ridge.....	.....	.....	61-4	—	0-4	5 81-0	17	41-0	23 15-4 30-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NOVA SCOTIA																							
Yarmouth.....	30-00 30-27 29-70	0-57	61-7	+	1-5	12 76-5	10	44-5	24 12-5 22-1	59-0	84	7	11	11	6	8	8	7	14	1	3	4	
Sydney.....	30-02 30-36 29-68	0-68	63-0	+	0-1	22 82-7	5	44-6	27 15-7 33-9	.....	.....	6	13	3	6	8	9	11	11	7	1	9
Halifax.....	30-02 30 29 30-61	0-65	61-5	—	1-7	18 83-2	17	19-7	27 11-7 21-0	.....	.....	7	12	1	4	8	9	4	11	7	8	
Truro.....	30-01 30 29 30-61	0-65	63-1	—	1-8	19 85-0	5	42-8	27 19-2 35-3	.....	.....	7	9	5	11	3	8	16	10	9	4	
Pictou.....	.....	.....	60-8	—	2-3	14 82-0	5	42-0	30 13-3 25-0	.....	.....	.....	.....	4	12	17	7	13	23	1	12	
Digby.....	.....	.....	65-3	—	2-8	12 80-0	13	52-0	27 19-2 35-3	.....	.....	6	12	5	19	20	10	0	7	11	5	
Whitehead.....	.....	.....	63-0	—	1-6	8 70-0 25-30	37-0	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sable Island.....	.....	.....	66-7	+	2-7	8 82-0	13	57-5	27 15-2 22-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Hastings.....	.....	.....	61-1	—	—	82-0	6	42-0	27 15-2 22-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NEWFOUNDLAND																							
St. John's.....	30-08 30-26 29-70	0-66	57-6	—	2-5	20 78-0	17	32-0	14 16-9 20-0	.....	.....	5	1	4	6	5	6	11	5	5	4	
P. E. ISLAND																							
Kilmaleig.....	.....	.....	63-4	—	0-4	14 81-1	18	12-5	23 15-9 32-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgetown.....	.....	.....	66-0	+	0-7	3 82-5	5	50-0	23 20 12 7 28 0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charlottetown.....	30-00 30-32 29-72	0-60	63-8	—	0-7	16 78-3	17	19-0	27 11-2 21-6	.....	.....	6	6	59	79	46	83	69	155	22	53	
BRITISH COLUMBIA																							
Esquimalt.....	30-01 30-29 29-75	0-64	58-8	+	0-5	2 75-7	29	47-2	27 18-1 24-5	53-8	81	4	2	6	0	1	2	08	20	9	1		
Quamichan.....	.....	.....	63-1	—	0-5	6 86-0	8	42-0	2 4 30-9 42-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barkerville.....	.....	.....	53-4	—	1-1	1 87-0	2	33-4	31 27-6 17-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Agassiz.....	.....	.....	63-0	—	1-1	2 90-0	19	47-0	2-5 26-6 41-0	.....	.....	5	1	.....	.....	.....	.....	.....	.....	.....	.....
Abbotsford.....	.....	.....	62-8	—	1-2	3 81-0 20-22	11-0	41-0	26 24-3 36-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nanaimo.....	.....	.....	66-5	—	—	87-0	21	45-9	16 21-1 35-1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Simpson.....	30 32 30-37 29-66	0-71	57-6	—	1-3	5 69-5	13	21-0	21 12-3 28-5	.....	.....	8	21	.....	.....	.....	.....	.....	.....	.....	.....
Donald.....	.....	.....	59-3	—	1-8	1 90-0	9	35-0	21 31 2 52-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spence's Bridge.....	20-94 30-38 29-55	0-85	69-8	—	3-0	4 93-0	8-9	50-0	7 27-8 40-0	55-5	52	5	0	0	0	12	2	4	10	13	1		

STATIONS RECEIVED TOO LATE FOR THE JULY REVIEW.

PR VINCE.	STATION.	MEAN TEMP.	HIGHEST TEMPERATURE.		LOWEST TEMPERATURE.		PRECIPITATION.		AURORA.	T ^h UNDER- STORMS.
			Temp.	Date.	Temp.	Date.	Amount.	Days.		
		°	°		°		in.			
N. W. Territories.....	Regina	65.89	94.0	5	38.0	29	1.22	9		6, 7, 10, 18, 21, 22.
	Indian Head	60.45	96.0	6	35.0	25	1.09	3		
Manitoba.....	Channel Island.....	66.51	84.0	20	46.0	31	1.72	7	7, 12, 16, 18, 27, 29.	9, 10, 17, 19, 23, 26.
Ontario.....	Little Current,	68.69	91.0	23	46.0	1	2.47	6	14, 16, 17, 19, 20.	12 and 21.

PRECIPITATION.

The rainfall throughout the Dominion has, except in the Province of Manitoba, exceeded the normal quantity, in some parts considerably over double the average has fallen, and at some stations in the Maritime Provinces the amount due to two or three days amounts from 8 to 16 inches.

The general distribution is as follows :—

In British Columbia the rainfall was in general 2.97 in., or about 1.86 in., above the average.

In the N. W. Territories, 2.02 in., about 0.11 in. above the average.

In Manitoba the rainfall was 2.41 in., or 0.20 in. below the average.

In Ontario West and South-West district, it was 3.23 in., or 0.69 in. above the average. In the North and North-West district, it was 4.73 in., or 2.59 in. above the average. In the Central district it was 3.61 in., or 1.57 in. above the average, and in the East and North-East district it was 5.45 in., or 3.35 in. above the average.

In Quebec it was 4.33 in., or 1.15 in. above the average.

In New Brunswick it was 6.29 in., or 2.70 in. above the average.

In Nova Scotia it was 8.04 in., or 4.13 in. below the average.

In Prince Edward Island it was 7.26 in., or 3.77 in. above the average.

Rainfall 5 in. and upwards during month :—

British Columbia, Fort Simpson, 13.23 in.

Ontario, Buda, 5.89 in. ; Savanne, 8.37 in. ; Owen Sound, 5.42 in. ; Egremont, 5.02 in. ; Sprucedale, 6.68 in. ; Whiteside, 5.25 in. ; Coldwater, 6.16 in. ; Beatrice, 6.12 in. ; Gravenhurst, 8.36 in. ; Point Clark, 5.43 in. ; Paris, 7.29 in. ; Bognor, 5.32 in. ; St. George, 6.84 in. ; Elora, 5.06 in. ; Georgina, 5.90 in. ; Kingston, 7.77 in. ; Haliburton, 6.08 in. ; Clontarf, 5.88 in. ; Oliver's Ferry, 6.64 in. ; Burk's Falls, 6.14 in. ; Belleville, 5.57 in. ; Glastonbury, 7.30 in. ; Port Hope, 5.84 in. ; Denbigh, 6.22 in. ; Blenheim, 6.75 in. (5.35 in. in 16 hours) ; Bancroft, 8.26 in. ; Midland, 5.64 in. ; Presque'Isle, 8.30 in. ; Ennismore, 6.30 in. ; Watford, 6.04 in. ; Fergus, 5.20 in. ; Novar, 6.03 in.

Quebec, Point des Mont, 6.20 in. ; Montreal, 5.34 in. ; St. Hyacinthe, 6.89 in. ; Brome, 6.18 in.

New Brunswick, Fredericton, 6.99 in. ; Chatham, 7.14 in. ; St. Andrews, 5.38 in. ; Point Lepreaux, 7.45 in. ; Dorchester, 5.38 in. ; Dalhousie, 6.52 in. ; Parker Ridge, 7.86 in. ; St. John, 8.98 in.

Nova Scotia, Sydney, 6.72 in. ; Halifax, 6.80 in. ; Truro, 5.32 in. ; Pictou, 5.03 in. ; Whitehead, 11.00 in. ; Sable Island, 18.05 in. ; Cow Bay, 7.34 in. ; Port Hastings, 7.74 in.

Newfoundland, St. John, 6.37 in. ; Channel, 7.44 in.

Rainfall 1 inch and upwards in 24 hours :—

1. Fort Simpson, 1.00 in.

2. Savanne, 1.10 in. ; Morden, 1.04 in. ; Fort Simpson, 1.40 in. ; St. John, 1.16 in.

3. Channel, 1.00 in. ; Pelee Island, 1.50 in.

4. Georgetown, 1.15 in. ; Fort Simpson, 1.30 in.

5. Beatrice, 1.52 in.

6. Sprucedale, 1.10 in.

7. Brandon, 1.47 in. ; Oak River, 1.71 in.

8. Denbigh, 1.08 in. ; Wiarton, 1.20 in. ; Novar, 2.40 in. ; Gravenhurst, 2.81 in. ; Owen Sound, 1.25 in. ; Mattawa, 1.42 in. ; Greenwood, 1.94 in.

9. Burk's Falls, 1'00 in. ; Oliver's Ferry, 1'99 in. ; Bancroft, 1'94 in. ; Elora, 2'82 in. ; Sprucedale, 2'26 in. ; St. George, 1'83 in. ; Clontarf, 1'18 in. ; Whiteside, 1'70 in. ; Fergus, 2'92 in. ; Presqu'Isle, 3'90 in. ; Coldwater, 1'06 in. ; London, 2'80 in. ; Fort Simpson, 1'44 in.

10. Coldstream, 2'18 in. ; Princeton, 2'20 in. ; Aurora, 1'38 in. ; Belleville, 1'03 in. ; Wilton Grove, 2'30 in. ; Sarnia, 1'80 in. ; Thedford, 1'18 in. ; Burk's Falls, 2'10 in. ; 1'10 in. in one hour ; Point Clark, 1'05 in. ; Beatrice, 1'35 in. ; Clontarf, 1'17 in. ; St. Hyacinthe, 1'40 in. ; Georgina, 2'21 in. ; Paris, 3'50 in. ; St. Mary's, 1'00 in. ; Wyoming, 1'00 in. ; Barrie, 1'74 in. ; Watford, 5'00 in. ; Durham, 1'16 in. ; Guelph, 1'22 in. ; Parry Sound, 1'16 in. ; Woodstock, 1'13 in.

11. Denbigh, 1'50 in. ; Brome, 1'72 in. ; Richmond, 1'20 in. ; Lion's Head, 1'42 in. ; Channel, 1'00 in. ; Georgetown, P.E.I., 1'78 in. ; Father Point, 1'02 in. ; Sydney, 1'42 in. ; St. George, 2'03 in. ; Gravenhurst, 1'19 in. ; Uplands, 1'65 in. ; St. Hyacinthe, 1'82 in. ; Haliburton, 1'21 in. ; Paris, 2'63 in. ; Birnam, 1'87 in. ; Dorchester, N.B., 1'08 in. ; Wyoming, 1'20 in. ; Thompson, 1'10 in. ; Fredericton, 1'13 in. ; Ottawa, 1'17 in. ; Charlottetown, 1'84 in. ; Chatham, 1'09 in. ; Lennoxville, 1'09 in. ; Montreal, 1'04 in.

12. Cape Magdalene, 1'43 in. ; Brome, 1'15 in. ; Digby, 1'00 in. ; Point Lepreaux, 2'20 in. ; Channel, 1'44 in. ; Dalhousie, 2'03 in. ; Parker's Ridge, 1'17 in. ; Fredericton, 2'00 in. ; Little Forks, 1'00 in. ; Bathurst, 3'50 in. ; Chatham, 1'37 in. ; St. Andrews, 1'49 in. ; Grand Manan, 1'20 in. ; Lennoxville, 1'59 in. ; St. John, 3'53 in.

13. Anticosti, W.P., 1'11 in. ; Dalhousie, 1'49 in. ; Parker's Ridge, 2'35 in. ; Point des Monts, 2'40 in. ; Kilmahumag, 1'04 in. ; St. John's, Nfld., 1'30 in. ; Chatham, 2'62 in.

14. Cape Magdalene, 1'56 in. ; Cape Chatte, 1'03 in. ; Point Lepreaux, 1'05 in. ; Cow Bay, 1'25 in. ; Dalhousie, 1'26 in. ; Point des Monts, 1'80 in. ; Whitehead, 3'48 in. ; Gretna, 1'12 in.

15. Georgetown, 1'49 in. ; Pictou, 1'40 in. ; Morden, 1'30 in. ; Truro, 2'47 in. ; Charlottetown, 3'31 in. ; Halifax, 1'91 in.

16. Barelay, 1'50 in. ; Channel, 1'40 in. ; Oak Bank, 1'38 in. ; Whitehead, 2'50 in. ; Port Hastings, 1'90 in. ; Carmen, 1'10 in. ; Norquay, 1'52 in.

17. Cow Bay, 2'25 in. ; Pembina Crossing, 1'34 in. ; Gretna, 1'27 in. ; Morden, 1'24 in. ; Little Forks, 1'00 in. ; Qu'Appelle, 1'05 in. ; Regina, 1'25 in.

18. Buda, 1'05 in. ; Fort Francis, 2'50 in. ; Savanne, 2'26 in. ; Winnipeg, 1'28 in. ; Carmen, 1'15 in. ; Little Forks, 1'35 in.

19. Fort Francis, 1'15 in.

20. Rathwell, 1'56 in. ; Little Forks, 1'00 in. ; Lennoxville, 1'20 in.

21. Sable Island, 3'84 in. ; Cow Bay, 1'10 in.

22. Sable Island, 4'42 in. ; St. John's, Nfld., 1'13 in.

24. Belleville, 2'50 in. ; Glastonbury, 1'20 in. ; Deer Park, 1'22 in. ; Peterbrough, 1'25 in. ; Orillia, 1'34 in. ; Pelee Island, 1'07 in. ; Ennismore, 3'00 in. ; Coldwater, 1'22 in. ; Port Stanley, 1'02 in.

25. Blenheim, 5'35 in. ; Credit, 1'10 in. ; Port Hope, 2'53 in. ; Mount Forest, 1'33 in. ; Oliver's Ferry, 2'58 in. ; Bognor, 1'51 in. ; Wiarton, 1'08 in. ; Brome, 2'62 in. ; Bancroft, 1'46 in. ; Point Clark, 3'02 in. ; Richmond, 1'30 in. ; Egremont, 2'11 in. ; Point Lepreaux, 1'35 in. ; Alton, 1'09 in. ; North Bruce, 1'70 in. ; Niagara Falls, S., 1'06 in. ; Lyons, 1'22 in. ; Owen Sound, 1'86 in. ; St. Hyacinthe, 1'86 in. ; Welland, 1'20 in. ; Lakefield, 2'25 in. ; Georgina, 1'67 in. ; Scarboro', 1'27 in. ; Presqu'Isle, 1'63 in. ; Georgetown, 1'47 in. ; Sunshine, 1'26 in. ; Durham, 1'01 in. ; Deseronto, 2'02 in. ; Alexandria, 1'85 in. ; Kingston, 5'19 in. ; Saugeen, 1'32 in. ; Lennoxville, 2'03 in. ; Toronto, 1'06 in. ; Montreal, 2'05 in.

26. Sable Island, 1'45 in. ; Saskatoon, 1'23 in. ; Port Hastings, 1'07 in. ; Little Forks, 1'00 in. ; St. Andrews, 1'05 in. ; Halifax, 1'08 in.

27. Sable Island, 2'15 in. ; Point Lepreaux, 1'60 in. ; Parker's Ridge, 1'00 in.

28. Sable Island, 4'16 in. ; Fort Francis, 1'12 in. ; Fort Simpson, 2'62 in. ; St. Andrews, 1'09 in. ; St. John, 1'11 in.

29. Wiarton, 1'11 in. ; Fort Simpson, 1'04 in.

30. Buda, 2'11 in. ; Bognor, 1'02 in. ; Savanne, 1'60 in. ; Gravenhurst, 1'15 in. ; Midland, 1'30 in. ; Durham, 1'00 in. ; Lindsay, 1'32 in. ; Coldwater, 1'34 in. ; Port Arthur, 1'72 in.

31. Bancroft, 1'65 in. ; St. George, 1'36 in. ; Beatrice, 1'35 in. ; Whiteside, 1'16 in. ; Ennismore, 1'15 in.

Thunder recorded on—

1. St. Thomas, Barrie, Georgetown, Hillview, Treherne, Oakdale, Portage la Prairie, Ridgetown, Kingsville, Georgina, Uplands, Elkhorn, Sombra, Poser, Novar, Saskatoon, Bognor, Sable Island, Burk's Falls.

2. Georgetown, Rathwell, Morden, Norquay, Owen Sound, Pelee Island, Savanne, Sable Island, Barclay, Aurora.
3. St. Thomas, Presqu'Isle, Portage la Prairie, Zurich, Kingsville, Birnam, Lucknow, Pelee Island, Uplands, Gravenhurst, Beatrice, Alton, Sombra, Lion's Head, Bognor, Burk's Falls, Little Forks.
4. Georgetown, Wyoming, Scarboro', Winnipeg, Gretna, Portage la Prairie, St. Mary's, Alton, Parker's Ridge, Sprucedale, Posen, Saskatoon, Chicoutimi, Fredericton, Durham, Toronto.
5. Cowal, St. Albans, Rathwell, Pembina Crossing, Treherne, Morden, Fort Ellice, Portage la Prairie, Dorchester, N.B., Kilmahumaig, Parker's Ridge, Brandon, Truro, Elora, Saskatoon, Toronto, St. John.
6. Winnipeg, Pembina Crossing, Hillview, Treherne, Oakdale, Norquay, Portage la Prairie, Elkhorn, Gravenhurst, Oakbank, Glenbow, Posen, Saskatoon, Belleville, Truro, Little Forks, Ottawa, Deseronto, Wallace.
7. St. Albans, Hillview, Norquay, Fort Ellice, Portage la Prairie, Elkhorn, Gravenhurst, Channel, Brandon, Posen, Henrietta, Saskatoon.
8. Midland, Greenwood, Portage la Prairie, Glen Adelaide, Kingsville, Georgina, Lucknow, Haliburton, Owen Sound, Whiteside, Uplands, Beatrice, Sprucedale, Lion's Head, Posen, Novar, Peterboro', Wiarton, Bognor, Cartier, Calvin, Burk's Falls, Little Current.
9. St. Thomas, Barrie, Georgetown, Presqu'Isle, Scarboro', Midland, Pembina Crossing, Oakdale, Fort Ellice, Portage la Prairie, Glen Adelaide, Brantford, Mattawa, Lindsay, Barkerville, Zurich, Kingsville, St. Mary's, Birnam, Paris, *hail 1½ in. in diameter, terrific storm of wind*; Lucknow, Owen Sound, Whiteside, Clontarf, Pelee Island, Uplands, Beatrice, Alton, Sombra, Lion's Head, Egremont, Brandon, Elora, Point Clark, *terrific*; Novar, Brome, Peterboro', Bognor, Cartier, Calvin, Princeton, Belleville, Mount Forest, Thedford, Durham, Coldwater, London, Ottawa, Deseronto, Alexandria, Toronto.
10. St. Thomas, Barrie, Georgetown, Presqu'Isle, Scarboro', Portage la Prairie, Zurich, St. Mary's, Birnam, Paris, Georgina, Lucknow, Haliburton, Welland, Parker's Ridge, St. Hyacinthe, Owen Sound, Whiteside, Clontarf, Uplands, Beatrice, Alton, Sombra, Sprucedale, Lion's Head, Egremont, Richmond, Brome, Peterboro', Calvin, Coldstream, Mount Forest, Durham, Lindsay, Coldwater, Ottawa, Deseronto, Alexandria, Lennoxville, Toronto, Little Current.
11. Georgetown, Presqu'Isle, Scarboro', St. Albans, Portage la Prairie, Glen Adelaide, Dorchester, N. B., St. Mary's, Haliburton, Welland, Whiteside, Pictou, Little Forks, Parker's Ridge, Brandon, Digby, Brome, Henrietta, Saskatoon, Burk's Falls, Fredericton, Durham, Deseronto, St. John.
12. Winnipeg, Pembina Crossing, Portage la Prairie, Kilmahumaig, Oakbank, Posen, Sable Island, Cartier, Regina, St. John.
13. St. Albans, Portage la Prairie, Glen Adelaide, Barkerville, Sable Island, Fredericton, Truro, Alexandria.
14. Hillview, Morden, Fort Ellice, Portage la Prairie, Kilmahumaig, Posen, Henrietta, Saskatoon, Regina.
15. Winnipeg, Pembina Crossing, Norquay, Fort Ellice, Portage la Prairie, Glen Adelaide, Elkhorn, Glenbow, Brandon, Regina.
16. Pembina Crossing, Treherne, Norquay, Portage la Prairie, Glen Adelaide, Uplands, Savanne, Egremont, Novar, Calvin, Barclay, Little Forks, St. John.
17. Pembina Crossing, Oakdale, Portage la Prairie, Dorchester, N. B., Kilmahumaig, Mattawa, Uplands, Gravenhurst, Parker's Ridge, Posen, Novar, Fredericton, Little Forks.
18. Norquay, Glen Adelaide, Birnam, Georgina, Uplands, Savanne, Glenbow, Posen, Peterboro', Bognor, Truro.
19. St. Thomas, Cowal, Scarboro', Pembina Crossing, Portage la Prairie, Glen Adelaide, Brantford, Zurich, Birnam, Georgina, Welland, Pelee Island, Uplands, Alton, Sombra, Sprucedale, Egremont, Elora, Posen, Richmond, Stoney Creek, Brome, Chicoutimi, Belleville, Thedford, Burk's Falls, Ottawa, Lennoxville, Regina, Toronto.
20. Georgetown, Portage la Prairie, St. Hyacinthe, Little Forks.
21. Portage la Prairie, Sable Island.
22. Sable Island.
23. Haliburton, Alton, Peterboro', Cayuga, Little Forks.
24. St. Thomas, Ennismore, Cowal, Scarboro', Zurich, Kingsville, Lucknow, Haliburton, Whiteside, Pelee Island, Uplands, Gravenhurst, Beatrice, Alton, Orillia, Glenbow, Stoney Creek, Peterboro', Saskatoon, Calvin, Belleville, Durham, Lindsay, Coldwater, London, Alexandria, Toronto.

25. St. Thomas, Ennismore, Scarboro', Pembina Crossing, Elkhorn, Egremont, Henrietta, Belleville.
26. Pembina Crossing, Savanne, Orillia, Saskatoon, Belleville, Little Forks.
27. Winnipeg, Pembina Crossing, Little Forks, St. John.
28. Sable Island, Little Forks.
29. Sable Island, Calvin.
30. Barrie, Georgetown, Presqu'Isle, Scarboro', Midland, Zurich, St. Mary's, Birnam, Georgina, Lucknow, Haliburton, Welland, Owen Sound, Whiteside, Clontarf, Uplands, Gravenhurst, Beatrice, Alton, Sombra, Sprucedale, Egremont, Elora, Point Clark, Novar, Peterboro', Wiarton, Bognor, Cartier, Princeton, Aurora, Belleville, Burk's Falls, Lindsay, Coldwater, Deseronto, Toronto, Little Current.
31. Zurich, Henrietta, Deseronto.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1. Father Point, IV.
2. Port Arthur, III.
3. Savanne, Esquimalt, IV½; Little Forks, IV; Father Point, II.
4. Buda, III; Savanne, Dorchester, N.B., Truro, IV; Little Forks, IV; Alexandria, III; Quebec, IV.
5. Little Forks, III; White River, III.
6. Prince Albert, II; Prince Albert, II.
7. White River, II; Father Point, III.
8. Hillview.
9. Alexandria, IV.
10. Saskatoon, I.
11. Buda, III; Little Current, IV.
12. Novar, Posen, II; Elora, Egremont, II; Alton, II; Beatrice, IV; Elkhorn, III; Hillview, Kingsville, IV; Ridgetown, Pembina Crossing, III; St. Albans, III; Georgetown, III; Durham, IV; White River, IV; Port Arthur, III; Port Stanley, III; Toronto, IV; Little Current, III.
13. Posen, IV; Bognor, IV; Henrietta, III; Alton, I; Georgina, Kingsville, IV; Zurich, Ridgetown, Georgetown, III; St. Thomas, IV; Durham, II; Lindsay, II; Wallace, II; Alexandria, IV; White River, IV; Minnedosa, IV; Port Stanley, III; Prince Albert, I; Toronto, IV; Prince Albert, I.
14. Zurich, Port Arthur, III; Toronto, II.
16. Georgetown, P.E.I., Truro, IV; Alexandria, IV.
18. Minnedosa, II.
19. Novar, IV; Posen, II; Calvin, I; Chicoutimi, IV; Saskatoon, III; Clontarf, St. Albans, III; Coldwater, IV; Alexandria, IV; White River, III; Minnedosa, I; Quebec, IV; Little Current, IV.
20. Chicoutimi, IV; Elkhorn, III; Birnam, III; Pembina Crossing, III; St. Albans, II; Quebec, IV; Minnedosa, II; Father Point, III.
21. Saskatoon, I; Henrietta, II; Elkhorn, III; Hillview, St. Albans, IV; Father Point, III; Medicine Hat, IV.
22. Posen, IV; Henrietta, III; Winnipeg, Father Point, III; Medicine Hat, IV; Prince Albert, IV.
23. Clandeboye, Cape Chatte, IV; Truro, III; Minnedosa, IV; Quebec, IV; Father Point, III; Sydney, III; Richmond, IV; Posen, III; Henrietta, III; Oak Bank, II; Georgetown, P.E.I., Elkhorn, III; Hillview, Dorchester, Portage la Prairie, III; Winnipeg, *bright*; Pembina Crossing, II; St. Albans, III; St. Andrews, IV; Medicine Hat, IV; Little Current, IV.
24. Richmond, IV; Posen, II; Oak Bank, I; Georgetown, P.E.I., Savanne, Elkhorn, IV; Hillview, Dorchester, Portage la Prairie, III; Winnipeg, *bright*; Pembina Crossing, IV; St. Albans, III; Clandeboye, Truro, Minnedosa, III; Quebec, IV; Charlottetown, IV; Sydney, III; Yarmouth, IV; Prince Albert, III.
25. Posen, IV; Calvin, I; Oak Bank, I; Winnipeg, *bright*; Pembina Crossing, IV; St. Albans, III; Little Forks, II; Medicine Hat, IV.

26. Novar, IV ; Posen, II ; Chicoutimi, IV ; Egremont, III ; Clandeboye, Minnedosa, II
Quebec, IV ; Father Point, IV ; Halifax, IV.

28. Elkhorn, III ; Hillview.

29. Posen, I ; Hillview, Georgina, Father Point, IV.

30. Elkhorn, I ; Hillview, Father Point, IV.

31. Winnipeg, Pembina Crossing, IV.

Frost accorded on—

1. Savanne (32).

20. Oakdale, Fort Ellice, Burk's Falls.

22. Parker's Ridge.

25. White River (29°).

28. Bradwardine, Cartwright, Peterboro'.

29. St. Albans, all green wheat, citrons, beans killed, Pembina Crossing, Hillview, ice $\frac{1}{2}$ in.
Fairburn, Oakdale, Shoal Lake, Cartwright, Pilot Mound, 29° ; Brandon, 29° ; Peterboro'.

30. Rathwall, Hillview, ice $\frac{1}{2}$ in., Treherne therm. 26°, *wheat damaged*, Shoal Lake, Morden, 28° ;
Norway, 26° ; Belmont, Portage la Prairie, Brandon, 31° ; Posen, 30° ; Fort Francis, 20°.

31. Savanne, 32° ; Fort Francis, 10° ; White River, 30°.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE
THE HORIZON IN THE MONTH OF AUGUST, 1892.

	HOURS ENDING															
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.
ESQUIMALT.....	0	0 11	0 38	0 63	0 76	0 81	0 87	0 81	0 76	0 78	0 78	0 82	0 73	0 69	0 65	..
AGASSIZ, B.C. ....	..	8	27	45	59	61	66	73	70	70	66	63	49	21	8	..
BRANDON.....	..	06	32	64	73	80	83	83	85	81	79	72	61	48	23	..
INDIAN HEAD.....	..	06	40	52	62	64	68	65	70	69	66	64	55	48	20	..
WINNIPEG.....	3	35	57	64	67	64	78	77	81	83	78	75	69	53	19	..
KINGSVILLE.....	..	8	29	59	71	80	78	77	70	71	72	67	56	38	10	..
WOODSTOCK.....	..	13	50	72	74	75	75	72	60	64	60	60	59	31	07	..
TORONTO.....	..	07	55	64	75	76	71	72	63	59	58	53	51	42	07	..
LINDSAY.....	..	09	39	56	63	67	72	64	65	59	61	55	47	35	29	8
BARRIE.....	..	10	49	54	62	68	70	67	62	57	55	54	46	41	07	..
KINGSTON.....	..	09	37	55	51	68	75	77	72	70	67	65	59	50	02	8
.....
MONTREAL.....	..	08	36	52	55	62	65	67	73	69	62	49	49	31	00	..
FREDERICTON.....	..	09	21	31	35	46	45	50	48	50	50	49	47	48	29	..
SYDNEY.....	..	10	27	38	43	46	55	51	48	45	45	38	30	23	06	..
.....
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)	0 62	0 48	0 60	0 52	0 61	0 56	0 55	0 54	0 52	0 50	0 56	0 56	0 39	0 36	..	..
MAXIMUM DAILY AMOUNT.....	0 87	0 82	0 88	0 89	0 95	0 89	0 86	0 90	0 98	0 90	0 93	0 97	0 94	0 93	..	..
DATE.....	17	17	23	23	23	12	29	29	29	29	29	28	16	22	7	..
NO. OF DAYS COMPLETELY CLOUDED.....	1	1	1	0	1	2	3	1	2	1	4	6	7	10	..	..

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 577. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
MANITOBA	95	62	16	17	73.7
LOWER LAKE REGION.....	107	86	14	7	86.9
UPPER ST. LAWRENCE	94	72	10	12	81.9
LOWER ST. LAWRENCE.....	95	60	14	21	70.5
GULF.....	97	63	16	18	73.2
MARITIME PROVINCES	89	63	16	10	79.8
TOTAL	577	406	86	85	77.8

In ascertaining the percentage of verification of the predictions, the reports from the agents at the "Probability" stations, as well as the telegraphic reports, are used.

The daily probabilities and storm warnings were issued by Probability Officer R. F. Stupart.

STORM WARNINGS.

During the month warnings on the approach of three storms were issued to our agents, and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 63, of which 44 or 69.8 per cent. were verified. At three stations, however, the force exceeded that indicated by the signals displayed; two stations reported warnings received late, owing to delay in issue, and two stations reported a storm for which no warning was sent.

In connection with the warnings, predictions as to probable directions of the wind were given, and of the 44 warnings verified as to force 44 or 100.0 per cent. were fully verified.

1. At 10.10 a.m. on the 18th Lake Superior stations were warned for a moderate S.W. to N.W. storm on account of a moderately deep depression then centred in the Upper Lake region. Port Arthur reports that the gale had begun before the warning was received, but increased in violence afterwards. At Sault St. Marie, however, the storm was not felt until some time after the signal was displayed. Safety warnings were despatched on the morning of the 19th.

2. At 11.40 a.m. on the 20th Gulf and Ocean stations were notified that a West India hurricane had been reported as passing near Bermuda the preceding night, and to hasten the east drums in anticipation of its approach up the Atlantic. On the morning of the 21st the warning was further extended as far west as Father Point, as the hurricane was apparently approaching our coasts. Ultimately, however, it passed more to the eastward and skirting Cape Breton during the night of the 21st it swept with great violence during the early portion of the 22nd over Newfoundland. Sydney reports that a strong north-east gale prevailed at midnight on the 21st. Louisburg, Glace Bay and Port Hood also experienced the effect of the hurricane to a lesser extent, but at other shore points it was not felt. Much damage was caused by the hurricane at sea; no great casualties occurred on our coasts. Signals were lowered at 10 a.m. on the 22nd.

3. At 10.25 a.m. on the 30th Lake stations from Sault St. Marie to Kingston were warned for a moderate S.W. to N.W. storm on account of a depression of some importance centred over Lake Superior. During the evening and night of the 30th and early morning of the 31st, a storm prevailed generally from the directions indicated, and on Lake Superior as well as at Midland and Port Burwell, a fresh or strong gale was experienced. Sault St. Marie reports that the steamer "Western Reserve" was wrecked during the night of the 30th about twenty miles north-west of Sable Point, and twenty-six persons were drowned. Signals were lowered at 4 p.m. on the 31st.

Between the 12th and 14th a heavy easterly gale prevailed in the Lower St. Lawrence Valley and the northern portion of the Gulf. It was caused by the movement of an area of high pressure of some importance down from the Northward. Much damage is reported to have been occasioned by the gale. No warning was issued for this storm.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR AUGUST, 1892.

The first two days were entirely free from disturbance. A moderate disturbance was felt between 8.30 and 11 a.m. of the 3rd, during the afternoon the magnets became much quieter. On the 4th the movements increased and during the night hours a disturbance was recorded. The *v. f.* on the morning of the 4th was steadily increased, and after 3 p.m. a decrease set in; there were no large movements. The declination magnet was the most affected. After 11 p.m. the magnets steadied down. From the 6th to the morning of the 10th small disturbances were going on. A marked feature on the declination curve during the morning of the 8th, was the steady and prolonged increase of westerly declination. The most important storm of the month broke out on the 12th, the declination which previous to 7.15 a.m. had been slightly disturbed, suddenly took a sharp easterly swing, followed by a large westerly one; the magnet then moved east, and after the noon observation violent vibrations commenced. During the afternoon they increased and from 0.45 to 3 p.m. the curve was one mass of vibrations. The total range of declination was $2^{\circ} 19'$, a marked minimum was registered at 1.47 p.m. After 3 p.m. the magnet began to move west and the changes became smaller. During the night hours the disturbance had almost died away, but after 11 p.m. there was a tendency to increased activity lasting about an hour.

The *h. f.* was changing considerably on the morning of the 12th, after 1 p.m. a rapid increase of the force began, the magnet at the same time oscillating violently. At 2 p.m. the spot of light moved off the paper. The change up to that time amounting to over .0084 C. G. S. On its return, the magnet was moving in long vibrations and a rapid decrease commenced, the magnet reaching its normal reading about 7 p.m. when the disturbance assumed an unimportant character. The vertical component although shewing some quick changes was not affected to anything like the same extent as the other magnets.

This disturbance was followed by a quiet period extending nine days, with the exception of a little irregularity on the evenings of the 13th, 16th and 19th, lasting a short time. Occasional little disturbances would afterwards appear up to the 24th at 6 p.m., when an increase in the movements began, the declination magnet then taking up a slow easterly swing. After the return, the magnet became much quieter, and after 1 a.m. next day there was a gradual westerly movement, a marked minimum taking place at 2.05 p.m., it then slowly returned to its normal position, but remained slightly disturbed until the evening when an increased activity set in lasting about three hours. During the remainder of the month slight disturbance was shown, the quietest periods being the afternoon and evenings of the 29th, 30th and 31st.

Auroral light in north, on the 12th, class III., 8 to 9 p.m.; class IV. at the 10 p.m. and mid-night observations. Faint auroral light on the 13th and on the 14th. From 9 to 10 p.m. pulsations and flashes of aurora reaching almost to zenith amongst clouds.

On the 2nd, 6th, 8th, 9th, 15th, 16th, 17th, 20th, 21st, 22nd, 27th, 28th, 29th and 30th, it was possible to see aurora. On all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL

Director.

METEOROLOGICAL OFFICE,

Toronto, October, 15th 1892.

Monthly Weather Review.

SEPTEMBER, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraphic reporting stations, was above the normal of eighteen years at nearly all our stations; the excess was, however, not great.

From the 1st until the 4th an anti-cyclone covered the Lake district and extended over Eastern Canada. It was accompanied by very fine warm weather and moderate winds, which settled into S. and S. W. as the anti-cyclone passed south-eastward.

During the 4th, a cyclone, which had moved from the North-west, was over the Lakes; and another cyclone appeared off the New England coast dividing the anti-cyclone into two portions. The night set in wet over the Lake district, and local thunderstorms occurred during the 5th, then the two cyclones coalesced over Eastern Canada, where it became generally showery, and the weather cleared with westerly winds over the Lake Region.

The next day the combined cyclone moved over Labrador, and anti-cyclonic conditions with fine weather extended from the Lakes to the Atlantic.

The fine weather, with pleasant temperature and high pressure, continued until the evening of the 10th in the Lake district, until the 14th in Quebec, and until the 15th in the Maritime Provinces, with the exception of the extreme S. W. portion of Ontario, where rain occurred on the 7th, owing to its proximity to the outer portion of a cyclone over the South-west States.

On the night of the 10th a cyclonic trough extended from the Hudson Bay to Texas. Thunderstorms and showers occurred in the Lake district and until the 13th fair warm weather, with showers, were the rule.

On the 13th a decided development took place, and a well-formed cyclone moved N. E. to the Lakes. Heavy rain fell over Ontario and a gale from the S. E. shifting to N. W. and W. occurred. Next day it rained heavily throughout Quebec, with strong easterly shifting on the 15th to south-westerly winds. Some rain fell in the Maritime Provinces during the night of the 15th, the weather clearing during that day in Ontario; and on the 16th the weather had become fine everywhere, the cyclone by that time passing N. E. over Labrador.

In the North-west on the 1st fair, warm weather prevailed, with local showers, which gave way next day to anti-cyclonic conditions and lower temperature. Local showers occurred each day until the 6th, with continued high pressure and moderate temperature.

The 6th brought a more cyclonic type and some local thunderstorms occurred in Assiniboia on the 7th.

During the 8th and 9th a small cyclone passed across the Territories, giving local showers. It was succeeded on the 10th by an anti-cyclone of some importance which was accompanied by fine weather. This lasted until the night of the 11th, when a slight pressure decrease over Manitoba was accompanied by some showers.

On the 13th pronounced cyclonic conditions set in over the Territories with higher temperature and strong W. to N. winds. These conditions were quickly transferred eastward and was succeeded on the 14th by an anti-cyclone, which in its turn also moved quickly south-eastward, giving place to a general depression on the 16th.

From the 1st until the 16th the weather in British Columbia was generally fair and warm, with slight pressure changes, excepting a few showers which fell on the coast during the 5th and 6th.

A large anti-cyclone covered the Lakes and Eastern Canada on the 16th, where it continued till the 18th, with fine warm weather and S. W. winds. The weather was for a short time disturbed in Eastern Canada by a slight depression which gave some showers there, and then on the 19th an important anti-cyclone moved down from the north with lower temperature, which caused some showers and local thunderstorms in Ontario. The weather then cleared up everywhere, the anti-cyclone extending from the Lakes to the Atlantic, with fine weather and moderate temperature. Fine weather and slowly rising temperature now prevailed from the Lakes to the Atlantic until the 22nd.

In the Northwest, from the 16th till the 18th, fine warm weather was general. On the latter day a rise in pressure occurred everywhere. This soon gave way to an extensive cyclone, which stretched from the Pacific Ocean to the Lakes, and hovered until the 25th, when it moved to the northward.

It caused a few showers in Manitoba, otherwise the accompanying weather was generally fair and moderately warm, excepting a frost in Alberta on the 22nd, and frosts over the greater part of the Territories on the 24th.

From the 16th to the 24th, in British Columbia, the weather was unsettled and occasional heavy rains fell near the coast, and on the 22nd a southerly gale occurred.

Some showers fell in Ontario and Quebec on the 22nd and 23rd, and on the 24th a cyclone developed over the Lakes. It caused unsettled weather and local rains in Ontario on the 25th. By the time it reached Quebec it had increased considerably in energy. A N. W. gale set in over Lower Lake district on the 26th, heavy rain fell in Eastern Canada, and by night a S. E. to S. W. gale was blowing there.

The cyclone moved eastward over Newfoundland, and the weather, which cleared in the Lake district on the 26th, also became fine throughout Eastern Canada on the 28th, and until the end of the month fine weather and moderate temperature prevailed from the Lakes to the Atlantic, excepting a few showers in the Gulf of St. Lawrence on the 30th.

In the Northwest generally fair warm weather, with no important change in pressure, continued from the 25th until the 30th. On that day an anti-cyclone developed over the Territories, bringing cooler weather and light frosts at night. In British Columbia during this period mostly cloudy weather with moderate winds and temperatures were the rule, and rain fell on the 26th and 28th.

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations, was above the normal of eighteen years in the Maritime Provinces and Manitoba, and also above the normal of nine years in the North-west. In Ontario it was slightly below normal.

The highest and lowest Temperatures in each Province during September were:

British Columbia, 90°·0 at Agassiz on 10th and 12th ; 22°·0 at Barkerville on 21st.

North-west Territories, 89°·2 at Medicine Hat on 28th ; 15°·4 at Calgary on 24th.

Manitoba, 87°·7 at Brandon on 20th ; 25°·5 at Minnedosa on 30th.

Ontario, 89°·6 at Coldwater on 24th ; 18°·8 at White River on 19th.

Quebec, 81°·0 at St. Hyacinthe on 4th ; 28°·0 at Brome on 29th.

New Brunswick, 82°·3 at Chatham on 4th ; 28°·0 at Dorchester on 30th.

Nova Scotia, 80°·0 at Truro on 6th ; 27°·7 at Truro on 30th.

Prince Edward Island, 78°·6 at Kilmahumaig on 15th ; 36°·9 at Kilmahumaig on 30th.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION, &c.—Continued.

[illegible]

ONTARIO—Concluded.

[illegible]

ABSTRACT OF TEMPERATURE AND SNOWFALL AT DONALD, B. C., NOVEMBER, 1891 TO JULY, 1892 INCLUSIVE. OBSERVER,
MR. T. A. BLYTHE.

	TEMPERATURE.					RAIN.		SNOW.	
	Mean.	Highest.	Lowest.	Mean Daily Range.	Greatest Daily Range.	Amount.	Days.	Amount.	Days.
1891.									
November	24.6	44.0	-9.0	13.7	27.0	....	....	19.2	9
December.....	26.7	43.0	-7.0	9.6	27.0	....	....	23.5	12
1892.									
January.....	9.9	37.0	-30.0	17.5	26.0	....	....	26.5	10
February.....	21.9	47.0	-11.0	22.4	36.0	....	....	4.5	8
March.....	35.8	58.0	12.0	25.1	40.0	....	....	4.7	1
April.....	39.3	67.9	16.0	23.3	45.0	....	....	4.2	2
May.....	48.0	80.0	23.0	28.9	48.0	....	....	7.5	2
June.....	56.5	93.0	31.0	34.0	48.0	....	....	....	....
July.....	58.6	91.0	32.0	26.7	53.0	....	....	....	....

PRECIPITATION.

The rainfall for September in Ontario has been considerably above the average ; in Quebec it was closely approximating to the average ; in the Maritime Provinces the rainfall was uniformly small and in British Columbia the amount considerably exceeded the normal although in the northern coast where the fall is usually very large the amount is about one-third below the average.

The general distribution is as follows :—

In British Columbia the rainfall was in general, 4.66 in., or about 0.83 in. above the average.

In the North-West Territories, 0.89 in., about 0.14 in. above the average.

In Manitoba the rainfall was 0.74 in., or 0.02 in. below the average.

In Ontario West and South-West district, it was 4.21 in., or 1.39 in. above the average. In the North and North-West district it was 4.50 in., or 0.81 in. above the average. In the Central district it was 3.26 in., or 0.60 in. above the average. And in the East and North-East district it was 3.40 in., or 0.47 in. above the average.

In Quebec, it was 3.27 in. or 0.02 in. above the average.

In New Brunswick, it was 1.83 in., or 2.74 in. above the average.

In Nova Scotia, it was 1.90 in., or 1.75 in. below the average.

In Prince Edward Island, it was 0.97 in., or 3.09 in. below the average.

Rainfall 5 in. and upwards during month :—

British Columbia, Barkerville, 6.73 in. ; Agassiz, 5.92 in. ; Abbotsford, 6.45 in. ; Fort Simpson, 8.23 in.

Ontario, Midland, 5.94 in. ; Watford, 5.91 in. ; Presqu'Isle, 6.27 in. ; Calvin, 5.89 in. ; Collingwood, 5.70 in. ; Dealtown, 5.00 in. ; Sunshine, 6.30 in. ; Wiarton, 5.51 in. ; Coldstream, 5.00 in. ; Burk's Falls, 5.51 in. ; Novar, 6.48 in. ; Owen Sound, 5.24 in. ; Uplands, 9.09 in. ; Durham, 5.72 in. ; Sprucedale, 5.18 in. ; Whiteside, 6.72 in. ; Orillia, 6.08 in. ; Coldwater, 5.44 in. ; Gravenhurst, 5.34 in. ; North Bruce, 5.32 in. ; Point Clark, 5.68 in. ; Bognor, 5.05 in. ; Cottam, 5.30 in. ; Kingsville, 5.08 in. ; Sombra, 5.75 in.

Quebec, Chicoutimi, 5.22 in.

Rainfall 1 inch and upwards in 24 hours :—

1. Barclay, 1.20 in.

2. Glastonbury, 1.00 in.

4. Buda, 1.43 in. ; Midland, 1.17 in. ; Cowal, 1.00 in. ; Dealtown, 1.34 in.

5. Egremont, 1.43 in. ; Novar, 1.02 in. ; Whiteside, 1.06 in. ; Welland, 1.02 in. ; Wilton Grove, 1.15 in. ; Coldwater, 1.13 in. ; London, 1.03 in.

6. Sydney, 1.04 in.

8. Brandon, 1.60 in.

10. Bognor, 1.24 in. ; Aurora, 1.11 in. ; Ennismore, 1.40 in. ; Durham, 1.00 in. ; Port Arthur, 1.23 in. ; Port Stanley, 1.03 in.

11. Cartier, 1'34 in.; Watford, 2'17 in.
12. Orillia, 1'18 in.; Uplands, 3.34 in.; Cottam, 1'33 in.; Mattawa, 1'32 in.; Sombra, 1'26 in.; Birnam, 1'34 in.; Calvin, 2'20 in.; Denham, 2'00 in.; Parry Sound, 1'13 in.
13. Bancroft, 1'98 in.; Elora, 1'33 in.; Norwood, 1'51 in.; Point Clark, 2'56 in.; Pelce Island, 2'77 in.; Kingsville, 3'43 in.; Owen Sound, 2'20 in.; Stoney Creek, 1'30 in.; Orillia, 1'01 in.; Axe Lake, 1'10 in.; Cottam, 1'90 in.; Peterboro', 1'75 in.; St. Mary's, 1'30 in.; Sombra, 3'33 in.; Zurich, 1'00 in.; Birnam, 1'97 in.; Wilton Grove, 1'80 in.; Aurora, 1'50 in.; Presqu'Isle, 2'18 in.; Lion's Head, 1'40 in.; Ridgetown, 2'49 in.; Watford, 1'40 in.; Scarboro', 2'00 in.; Princeton, 1'27 in.; Cowal, 1'39 in.; Cayuga, 1'48 in.; Sunshine, 1'29 in.; Denbigh, 1'24 in.; Wyoming, 2'52 in.; Wiarton, 3'70 in.; Port Hope, 1'50 in.; Mount Forest, 1'68 in.; Lyons, 1'11 in.; Belleville, 1'84 in.; Dealtown, 2'57 in.; Nelson, 1'49 in.; Credit, 1'60 in.; Georgetown, 1'38 in.; Barrie, 1'25 in.; St. Thomas, 1'96 in.; Thedford, 2'02 in.; Goderich, 1'56 in.; Lindsay, 1'15 in.; London, 1.41 in.; Rockliffe, 1'10 in.; Port Dover, 1'49 in.; Saugeen, 1'65 in.; Parry Sound, 1'47 in.; Port Stanley, 1'48 in.; Toronto, 1'82 in.; Little Current, 2'71 in.
14. Gravenhurst, 1'00 in.; Novar, 1'89 in.; Dalhousie, 1'44 in.; St. Hyacinthe, 1'12 in.; Cartier, 1'55 in.; Cape Chatte, 1'15 in.; Anticosti, W. P., 1'71 in.; Whiteside, 1'13 in.; St. George, 1'21 in.; Lakefield, 1'00 in.; Uplands, 1'42 in.; Sharon, 1'02 in.; North Bruce, 1'29 in.; Alton, 1'22 in.; De Cewsville, 1'50 in.; Deer Park, 1'57 in.; Sunshine, 1'44 in.; Thompson, 1'79 in.; Burk's Falls, 1'10 in.; Cottam, 1'44 in.; Paris, 1'19 in.; Lucknow, 1'48 in.; Fergus, 1'20 in.; Quebec, 1'57 in.; Guelph, 1'02 in.; Little Current, 1'62 in.
15. Cape Magdalen, 1'10 in.; Esquimaux Point, 3.12 in.; Fredericton, 1'35 in.
21. Orillia, 1'58 in.
22. Agassiz, 1'08 in.; Nanaimo, 1'20 in.
24. Agassiz, 1'07 in.; Abbotsford, 1'33 in.
25. Point Clark, 1'23 in.; Novar, 1'54 in.; Agassiz, 1'00 in.; Haliburton, 1'22 in.; Barkerville, 1'25 in.; St. Mary's, 1'39 in.; Quamichan, 1'00 in.; Presqu'Isle, 1'83 in.; Lion's Head, 1'04 in.; Collingwood, 1'45 in.; Durham, 1'26 in.; Saugeen, 1'24 in.
26. Gravenhurst, 1'34 in.; Brome, 1'98 in.; Beatrice, 1'31 in.; St. Hyacinthe, 1'87 in.; Richmond, 1'95 in.; Collingwood, 1'45 in.; Whiteside, 1'36 in.; Barkerville, 1'50 in.; Uplands, 1'50 in.; Denbigh, 1.15 in.; Montreal, 1'17 in.; Alexandria, 1'26 in.
27. Chicoutimi, 1'90 in.; Barkerville, 1'45 in.; Port Hastings, 1'50 in.
28. Agassiz, 1'08 in.
29. Glastonbury, 1'50 in.
30. Point des Monts, 1'40 in.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1. Gravenhurst, III; Kingsville, IV; Saskatoon, I; Dorchester, N.B.; Prince Albert, IV; Father Point, III; Quebec, IV.
2. Sydney, IV.
6. Winnipeg.
7. Little Forks, IV.
8. Egremont, III.
9. Father Point, III.
10. Haliburton, III; Hillview.
11. Saskatoon, I.
12. Elkhorn, IV; Saskatoon, IV; Hillview, Pembina Crossing, III; Rapid City, St. Albans, II; Truro, IV; Prince Albert, IV; Alexandria, IV.
13. Posen, IV; Hillview, Glen Adelaide, Port Arthur, II.
14. Henrietta, II; Minnedosa, III; Little Forks, IV.
15. Elkhorn, IV; Posen, IV; Brandon, IV; Savanne, Saskatoon, Henrietta, II; Sharon, II; Hillview, Georgetown, P.E.I., Winnipeg, Georgetown, IV; St. Albans, II; Prince Albert, II.
16. Elkhorn, IV; Posen, II; Novar, IV; Kingsville, IV; Savanne, Buda, II; Clontarf, IV; Sprucedale, Saskatoon, III; Henrietta, III; Sharon, II; Hillview, Georgetown, P.E.I., Winnipeg, Truro, IV; Georgetown, IV; St. Albans, IV; Father Point, III; Quebec, IV; Kingston, IV; Toronto, III; Montreal, II; Little Forks, III; Alexandria, II.

17. Posen, IV ; Saskatoon, IV ; Henrietta, III ; Hillview, Lucknow, Pembina Crossing, III ; Burk's Falls, IV ; St. Albans, III.
18. Elkhorn, III ; Posen, IV ; Savanne, Buda, II ; Saskatoon, IV ; Henrietta, I ; Fort Francis, I ; Hillview, Pembina Crossing, IV ; St. Albans, IV.
19. Chicoutimi, IV ; Fort Francis, I ; Pembina Crossing, IV ; Winnipeg.
20. Chicoutimi, IV ; Hillview.
21. Elkhorn, III ; Gravenhurst, IV ; Chicoutimi, IV ; Fort Ellice, III ; Point Clark, II ; Richmond, IV ; Truro, III ; Savanne, Buda, IV ; Saskatoon, IV ; Dorchester, N.B., *brilliant* ; Hillview, Georgetown, Ottawa, IV ; Pembina Crossing, IV ; Fredericton, II ; Father Point, II ; Yarmouth, IV ; Alexandria.
22. Savanne, Hillview, Pembina Crossing, III ; Eau Claire, I ; Minnedosa, II ; Sydney, III.
23. Savanne, Glen Adelaide, Pembina Crossing, IV ; Rapid City.
24. Glen Adelaide, Halifax, IV.
25. Hillview.
26. Fort Ellice, II ; Brandon, IV ; Savanne, Buda, IV ; Hillview.
27. Elkhorn, IV ; Gravenhurst, IV ; Novar, IV ; Savanne, Buda, III ; Saskatoon, II ; Hillview, Pembina Crossing, IV ; St. Albans, III.
28. Elkhorn, III ; Egremont, II ; Novar, IV ; Savanne, Buda, IV ; Saskatoon, III ; Henrietta, Fort Francis, II ; Sharon, III ; Welland, Dorchester, N.B., Hillview, Mattawa, Ridgetown, Pembina Crossing, II ; Rapid City, St. Albans, I ; Lindsay, III ; Coldwater, IV ; Truro, III ; Prince Albert, IV ; Halifax, IV ; Quebec, IV ; Saugeen, IV ; Kingston, III ; Montreal, III ; Little Forks, IV ; Alexandria, II.
29. Elora, White River, III.
30. Elora, Savanne, Pembina Crossing, II ; Fredericton, IV ; St. Albans, IV ; Halifax, IV ; Kingston, IV.

Thunder recorded on : -

1. Norquay, Pembina Crossing, Turtle Mountain, Winnipeg, French River.
2. Treherne, Little Forks.
3. Egremont, Little Forks.
4. Midland, Cowal, Georgetown, Barrie, St. Thomas, Ridgetown, Birnam, Sombra, Lucknow, Owen Sound, Kingsville, Elora, Gravenhurst, Alton.
5. Scarboro', Wilton Grove, Presqu'Isle, Wyoming, Nelson, Burk's Falls, Georgetown, Zurich, Sombra, Alton.
6. Rapid City, Pelee Island.
7. Orillia, Zurich.
8. Cottam.
9. Cowal, Saskatoon, Durham.
10. Presqu'Isle, Lion's Head, Cowal, Mount Forest, Cayuga, Wyoming, Nelson, Birnam, Burk's Falls, Georgetown, Barrie, St. Thomas, Norquay, Treherne, Rathwell, Pembina Crossing, Ridgetown, Sombra, Georgina, Lucknow, St. Mary's, Paris, Peterboro', Welland, Cottam, Sharon, Bognor, Uplands, Owen Sound, Whiteside, Kingsville, Pelee Island, Novar, Point Clark, Elora, Egremont, Beatrice, Gravenhurst, Alton, Lindsay, Durham, Toronto, Little Current.
11. Midland, Scarboro', Presqu'Isle, Eau Claire, Cowal, Thompson, Wyoming, Wiarton, Nelson, Burk's Falls, Georgetown, St. Thomas, Norquay, Ridgetown, Birnam, Sombra, Georgina, Mattawa, Lucknow, St. Mary's, Peterboro', Welland, Sharon, Niagara Falls, Bognor, Uplands, Owen Sound, Sprucedale, Whiteside, Kingsville, Novar, Point Clark, Egremont, Beatrice, Alton, Toronto.
12. Presqu'Isle, Dealtown, Wyoming, Birnam, Sombra, Georgina, Mattawa, Cottam, Bognor, Whiteside.
13. Nelson, Zurich, Cottam, Pelee Island.
14. Ridgetown, Sharon.
15. Scarboro', Mount Forest, Belleville, Cayuga, Georgetown, Birnam, Zurich, Lucknow, Sharon, Bognor, Shannonville, Haliburton, Owen Sound, Egremont, Alton, Lindsay, Coldwater, Durham, Toronto.
16. Kingsville.
17. Georgina.

18. Midland, Lion's Head, Belleville, Cayuga, Burk's Falls, Georgetown, St. Thomas, Thedford, Ridgetown, Zurich, Lucknow, Peterboro', Sharon, Shannonville, Haliburton, Stoney Point, Clontarf, St. Hyacinthe, Beatrice, Bancroft, Gravenhurst, Alton, Coldwater, Alexandria.

19. Scarboro', Cayuga, Denbigh, Nelson, Georgetown, Welland, Stoney Point, Brome, Ottawa, Toronto.

21. Rathwell, Pembina Crossing, Kingsville, Beatrice, St. Albans, Durham, Alexandria.

22. Presqu'Isle, Georgetown, Norquay, Shoal Lake, Rathwell, Pembina Crossing, Winnipeg, Selkirk, Birnam, Peterboro', Welland, Sharon, Bognor, Shannonville, Agassiz, Point Clark, Egremont, Posen, Bancroft, Elkhorn, Alton, St. Albans.

23. Calvin, Cowal, Belleville, Cayuga, Wyoming, Nelson, Barrie, St. Thomas, Norquay, Ridgetown, Birnam, Sombra, Lucknow, Sharon, Shannonville, Haliburton, Stoney Point, Clontarf, Kingsville, Novar, Oak Bank, Elora, Bancroft, Gravenhurst, Alton, Lindsay, Toronto.

24. Cayuga, Zurich, Kilmahumag, Georgina, Fort Francis.

25. Midland, Scarboro', Presqu'Isle, Lion's Head, Calvin, Cowal, Mount Forest, Belleville, Dealtown, Cayuga, Wiarton, Nelson, Georgetown, Barrie, St. Thomas, Thedford, Ridgetown, Birnam, Sombra, Georgina, Lucknow, St. Mary's, Paris, Dorchester, N.B., Peterboro', Welland, Sharon, Bognor, Shannonville, Uplands, Haliburton, Owen Sound, Sprucedale, Whiteside, *hailstones 2 in. by 1¼ in. ; great damage* ; Clontarf, Cartier, Kingsville, Novar, Point Clark, Norwood, Egremont, Beatrice, Bancroft, Gravenhurst, Alton, Lindsay, Coldwater, Durham, Toronto, Little Current, Alexandria.

26. Oliver's Ferry, Thompson, Cottam, Kingsville, St. Hyacinthe, *fearful storm* ; Brome, Chicoutimi, Ottawa, Lennoxville, Alexandria.

27. Agassiz, Lennoxville, Spence's Bridge.

28. Henrietta.

30. Pembina Crossing, Dalhousie.

Frost occurred on—

1. Thompson, Peterboro', Nicola Lake, Glenboro', Missanabie.

2. Burks' Falls, Birnam, Sombra, Peterboro', Brantford, Richmond, Egremont, Alexandria.

3. Dorchester, N. B.

4. Morden, Glenbow, Calgary, 27°.

5. Hillview, *ice* ; Shoal Lake, Pilot Mound, Rathwell, Fort Ellice, Wallace.

6. Little Forks, 30°.

7. Georgina, Alexandria.

8. Dorchester, N.B., Peterboro', Uplands, Axe Lake, Clontarf, Collingwood, Richmond, Alton, Gravenhurst, Little Forks, 30°.

9. Peterboro' Uplands.

10. Calgary, 31°.

11. Shoal Lake, 22°.

12. Turtle Mountain, 26°, *ice 1½ in.*

13. Treherne, De Clare, *hard* ; Hillview, 27° ; Indian Head, 29°.

14. Selkirk.

15. Treherne, 29° ; Clandeboye, Pembina Crossing, 30° ; Hillview, 31° ; Wallace, Minnedosa, 27° ; Prince Albert, 29°.

17. Belleville, Georgetown.

18. Calvin.

19. Calvin, Belleville, Oakbank, 30° ; Georgina, Buda, Savanne, 25° ; Minnedosa, 29°.

20. Scarboro', Calvin, Burk's Falls, *ice 1½ in.* ; Georgetown, Birnam, Sombra, Georgina, Lucknow, Peterboro', *ice* ; Sharon, Uplands, *ice 1¼ in.* ; Axe Lake, 30° ; Clontarf, Collingwood, Cartier, 29° ; Buda, Savanne, 28° ; Point Clark, Alton, Ottawa, Coldwater, Alexandria.

21. Peterboro' Cartier, 28° ; Lennoxville, Calgary, 28° ; Alexandria.

22. Glenbow, Wallace, 29° ; Calgary, 24°.

23. Minnedosa, 30°.

24. Saskatoon, Glenbow, Medicine Hat, 28° ; Calgary, 15°.

25. Oakbank, 30° ; Glenbow, Prince Albert, 29° ; Calgary, 22°.

26. Savanne, 27° ; Oakbank, 27° ; Minnedosa, 27°.

27. Zurich, Sombra, Shannonville, Axe Lake, 31° ; Cartier, Alton, Wallace, 31°.

28. Calvin, Shannonville, Savanne, 27°.

29. Calvin, Wiarton, Birnam, Georgina, Peterboro', Uplands, Clontarf, Glenbow, Richmond, Point Clark, Rockliffe, 30° ; Toronto.

30. Calvin, Zurich, Hillview, 30 ; Peterboro', Wallace, 21 ; Indian Head, 25° ; Minnedosa, 25° ; Prince Albert, 21° ; Calgary, 27° ; Rockliffe, 30°.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF SEPTEMBER, 1892.

HOURS ENDING																	
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.	
ESQUIMALT		0 00	0 07	0 33	0 48	0 53	0 55	0 57	0 60	0 58	0 51	0 46	0 42	0 11			
AGASSIZ, B.C.....		00	0 00	09	26	40	42	50	56	52	46	41	30	05			
BRANDON.....		00	0 05	31	53	66	59	59	60	62	63	57	51	18			
INDIAN HEAD.....		00	8	19	45	56	63	61	67	73	71	59	33	05			
WINNIPEG.....		8	16	40	55	63	69	66	56	51	52	42	22	04			
KINGSVILLE.....		00	00	27	65	76	77	79	80	79	74	73	43	03			
WOODSTOCK.....		00	01	11	37	55	69	76	81	80	72	63	40	12			
TORONTO.....		00	31	68	77	77	74	79	84	83	82	70	69	32	03		
LINDSAY.....		02	26	44	63	73	75	74	73	76	78	65	55	52	17		
BARRIE.....		00	10	53	62	65	63	71	77	78	74	70	60	38			
KINGSTON.....		8	20	51	67	74	75	74	73	74	76	68	52	18			
MONTREAL.....		01	16	56	65	68	68	70	72	77	67	59	52	10			
FREDERICTON.....		00	16	41	52	60	65	71	72	70	63	61	52	36	02		
SYDNEY		01	38	66	79	77	77	76	77	78	77	77	68	25			
				ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	KINGSVILLE.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)		0 42	0 32	0 47	0 44	0 43	0 54	0 47	0 66	0 62	0 57	0 58	0 62	0 53	0 65		
MAXIMUM DAILY AMOUNT.....		0 84	0 76	0 81	0 82	0 85	0 77	0 76	0 92	0 99	0 91	0 90	1 00	0 95	0 91		
DATE		9 10	10	25	12	26	27	26	28	3	29	20	2	8	3		
NO. OF DAYS COMPLETELY CLOUDED		8	7	1	2	3	2	3	0	1	2	1	4	2	1		

STORM WARNINGS.

During the month warnings on the approach of five storms were issued to our agents and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 214, of which 150 or 70·1 per cent. were verified. At eighteen stations the force of the wind exceeded that indicated by the signal displayed.

In conjunction with the warnings, predictions as to the probable direction of the wind were given, and of the 150 verified as to force 133 or 88·7 were verified as to direction.

1. At 10 a.m. of the 5th, with a depression developing over the Lake Region and another off the New England coast, Signal No. 2 for a moderate westerly gale was displayed at Lake Stations and No. 3 for a heavy easterly gale was displayed in the Maritime Provinces; the former of the depressions moved east and the latter north, the two coalescing and forming by evening a shallow depression over the St. Lawrence Valley and Maritime Provinces, and then during the night it moved to the Gulf with slightly increased energy. Strong winds and moderate gales occurred at many points on Lakes Huron and Ontario and the Georgian Bay during the evening of the 5th, and on the 6th. Safety telegrams were despatched at 10 p.m.

2. Signals indicating a moderate north-east shifting to north and north-west gale on Lake Superior, and from south shifting to north-west on the other Lakes, were ordered at 11 a.m. of 10th September—this owing to a depression over Northern Michigan which, however, moved northward

and developed but little energy. Strong winds and generally squally weather prevailed during the 10th and 11th, and signals were lowered during the forenoon of the 12th.

3. At 10.30 p.m. of the 10th, on account of the depression last mentioned, Signal No. 1 for a moderate gale, at first easterly, was displayed at all stations in Quebec and in the Bay of Chaleur. At most of the stations warned for the next two days the wind was from moderate to strong, not reaching the force of a gale, and signals were lowered during the forenoon of the 12th.

4. At 8 a.m. of 13th there was a developing area of depression moving northward across the Ohio Valley, and at 11.10 a.m. signal No. 2 was ordered for all lake stations. At 4 p.m. as the storm centre was developing very rapidly heavy gale signals were substituted. A moderate to fresh easterly gale began on Erie and Ontario towards evening and later at night a fresh to heavy south-westerly to westerly gale set in very generally on the lakes. Sault Ste. Marie, reports 6 p.m., 13th, N. W. moderate gale; Kincardine, 14th, 1 a.m., W. 40; Goderich, 11 p.m., 65-75; Port Dalhousie, S. W. 50; Toronto, 1 a.m. to 3 a.m., S. W. 36. At 10 p.m. warning of a heavy gale was extended to the Maritime Provinces. Strong winds and moderate gales from south-east and south set in pretty generally over the western part of the Gulf and Maritime Provinces on the 14th and during the early part of the following day a moderate to fresh south-westerly gale prevailed at most points. Father Point, 14th, 8 p.m., S. 34; Yarmouth, N.S., 15th, 6 a.m., S. 31; Digby, N.S. Midnight, 14th, S. 30-35.

5. On the evening of the 25th there was a developing depression moving quickly eastward over the northern part of the Lake Region, and at 9.35 p.m., signal No. 2, indicating a moderate westerly to northerly gale, was ordered for stations on lakes Erie and Ontario. The storm, which was heavy, began on the Upper Lakes early in the evening, and set in on the other lakes about midnight. Next morning at 10.10 a.m. as the storm was moving quickly eastward with still increasing energy, the warning was extended to all eastern stations, No. 4 for a heavy south, shifting to west and north-west gale being hoisted in the northern part of the Gulf, and No. 2 for a moderate gale at all other stations. In the Bay of Fundy the gale was moderate from the southward during the evening and night of the 26th, and fresh to heavy from the south-west in Cape Breton and the Gulf from late that night until the following night. Amherstburg, 25th, 8 p.m., N. W. 46; Port Dalhousie, 11 p.m., W. 40; Kingston, morning 26th, S. W. 40; Liverpool, N. S., 26th, 9 p.m., S. fresh gale; Liscombe, N. S., 28th, 6 a.m., W. strong gale; Louisburg, 27th, 8 p.m., S. W. fresh gale; Perce, 27th, midnight to 4 a.m., S. heavy gale; Father Point, 27th, 5 p.m., W. 44.

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 663. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
MANITOBA	105	73	18	14	78.1
LOWER LAKE REGION	116	89	13	14	82.3
UPPER ST. LAWRENCE	113	83	17	13	81.0
LOWER ST. LAWRENCE	109	74	17	18	75.7
GULF	111	83	17	11	82.4
MARITIME PROVINCES	109	87	15	7	86.7
TOTAL	663	489	97	77	81.0

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions, the reports from the agents at the "Probability" stations, as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer H. V. Payne.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR SEPTEMBER, 1892.

Slight disturbances prevailed on the first three days, and was followed by a quiet period lasting up to 6.05 p.m. of the 5th, when one of those preliminary movements to a large disturbance took place, both forces at first being suddenly decreased, followed by a larger increase, the bifilar being the most affected. These changes were attended by movements of the declination - first to the east and then to the west. Nothing of importance, however, followed. A small disturbance was going on up to the early morning of the 6th. On the evening of that day another small disturbance set in and was visible off and on to 6 p.m. of the 11th, when a steady magnet followed. After 6 p.m. the next day the curves became irregular, and about 8.30 an easterly sweep of the declination magnet was recorded, the minimum taking place at 9.03 p.m., when it moved west. A few sharp swings were shown between 3 and 4 a.m. next morning, the force magnets being the most affected. On the night of the 15th slow waves of disturbance appeared and were visible occasionally up to the morning of the 17th.

The next important disturbance appeared on the 21st and continued all day ; the movements were larger during the morning hours ; there were no large deviations from the normals. The 22nd was also disturbed, but to a much less extent, except between the hours of 4 and 5 p.m., when the changes were more prominent. On the night of the 27th the magnets again became unsteady, and a slight disturbance was visible to the end of the month.

Auroral light observed on the 16th with faint streamers—Class III. On the 1st, 2nd, 3rd, 4th, 6th, 7th, 8th, 9th, 11th, 17th, 19th, 20th, 24th, 26th, 27th, 28th, 29th and 30th the sky was clear, but no auroras were observed ; on all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL

Director.

METEOROLOGICAL OFFICE,

Toronto, November 18th, 1892.

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

OCTOBER, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraph reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraphic reporting stations, was below the normal of eighteen years at all stations to the east of the Great Lakes, the amount of the defect increasing eastward until at St. John's, Nfld.; it amounted to nearly 0.36 in. To the west of the Lakes the pressure was slightly above normal.

During the 1st there was an important high area spreading quickly across the Lake Region, there giving cold northerly winds, while with low pressure over Newfoundland, there was a gradient for strong north-westerly winds in the Gulf and Maritime Provinces, which prevailed with fine weather. In Manitoba and the North-west the weather was generally fine and warm, with southerly winds.

The week beginning the 2nd was very fine, and unusually warm for the season, in Manitoba and the North-west Territories, but in other parts of the Dominion the weather was generally unsettled, and high winds and fresh gales occurred both on the Lakes and in the Maritime Provinces. A depression, which on the morning of the 2nd was in Manitoba, moved slowly east across the Lakes, causing strong south to west winds and showery weather in the Lower Lake Region during the 3rd; then on the 4th, while with increasing energy, it lay off the New England and Nova Scotian Coasts, and on the 5th, as it moved North west to the Gulf of St. Lawrence, a moderate North-west to north gale with passing rain and snow squalls prevailed on the Lakes, and in the Maritime Provinces there was a heavy fall of rain, which on the 6th was followed by strong winds and gales from the west and south-west.

On the 6th there was a small depression moving to the Lakes from the North-west; during the early part of the 7th it developed somewhat, moving slowly from Lake Superior to the Georgian Bay, and strong winds and gales with showery weather were generally prevalent in the Lake Region; on the morning of the 8th the centre was near Lake Simcoe, whence it passed east with diminishing energy.

During the week beginning the 9th, anti-cyclonic conditions were mostly prevalent over the Lake Region and eastern part of the Continent generally, accompanied by fine, mild weather and light to fresh winds. Over the North-west Territories and Manitoba cyclonic conditions for the most part prevailed; for the first part of the week the weather was fine and mild, but on the 13th it set in colder in Alberta with light local snow, while further east in Assiniboia, Saskatchewan and Manitoba it became showery.

The charts for the week beginning the 16th showed two important storms occurring within our region of observation, one of them early in the week in Manitoba, and the other off the Atlantic Coast during the latter part of the week, affecting more especially Newfoundland and the Gulf of St. Lawrence. The former seems to have been the development of a depression which during the previous week had been hovering with varying energy over the North-west States, and which during the 16th increased in importance, and by the next morning had moved into Manitoba, causing a heavy south-easterly gale with rain in the eastern part of the Province, and a north-westerly gale with rain and snow in the western portion; after this it moved north-eastward and eastward with diminishing energy. A small subsidiary which formed to the southward of the main area on the

17th passed across the Lakes and St. Lawrence Valley to the Maritime Provinces, causing a pretty general rainfall in Ontario during the night of the 18th, in Quebec during the early morning of the 19th, and in New Brunswick and Nova Scotia later in the day. Except in the Maritime Provinces, fine weather, with temperature continuing above normal, succeeded the rain accompanying this storm, and lasted until the end of the week. The other storm mentioned was situated near the Newfoundland Coast during the last three days of the month, and caused strong north-west winds and gales generally in the Gulf and along our Atlantic Coast, showers occurring occasionally at various points. For the first three days of the week beginning the 23rd, the pressure was high over the western portion of the Continent, and low over the eastern portion, with the storm centre hovering near Newfoundland; this pressure distribution caused high north-westerly winds from the Lakes to the Gulf, with weather occasionally showery, while in the North-west Territories the winds were moderate and variable and the weather fine.

During the 26th and 27th, the high pressure drew more to the south-western and southern part of the United States, and there was a gradual decrease over Manitoba and to the northward of the Lake Region; although showers occurred in some parts of the country, particularly in Quebec and the Maritime Provinces, the weather was on the whole fair and mild. During the night of the 27th there was a rapid cyclonic development to the north-westward of Lake Superior, and by 8 a.m. the next day the centre of a severe storm was near Duluth, and a heavy North-west gale was blowing in Manitoba; this storm moved almost due east, and by night heavy south-west to north-west gales accompanied by rain were prevalent on all the Lakes. On the 29th, the centre moved east to the Bay of Fundy with diminishing energy, and the gale continued on the Lakes with cloudy and showery weather; it caused some rain but nothing more than a fresh to strong breeze in the St. Lawrence Valley.

In the eastern part of the Maritime Provinces there was a heavy north-easterly gale with rain during the early part of the day, caused by a storm centre which had passed near Bermuda on the morning of the 28th, and thence moved quickly north-eastward.

The charts of the 31st showed a developing area of low pressure over the South-western States, and an area of high to the northward of the Lakes, the subsequent movements of which will be described in next month's REVIEW.

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations, was slightly below the normal of eighteen years at all stations to the east of the Great Lakes, and decidedly above the normal to the west of the Lakes.

The highest and lowest Temperatures in each Province during October were:

British Columbia, 79°·0 on 3rd at Agassiz; 13°·0 on 15th at Barkerville.

North-west Territories, 84°·0 on 4th at Medicine Hat; 7°·2 on 17th at Calgary.

Manitoba, 85°·0 on 5th at St. Alban; 10°·3 on 29th at Brandon.

Ontario, 86°·7 on 13th at Little Forks; 17°·0 on 2nd at White River.

Quebec, 69°·0 on 14th at St. Hyacinthe; 9°·0 on 16th and 19th at Esquimaux Point.

New Brunswick, 67°·7 on 14th at St. Andrews; 17°·0 on 13th at Dalhousie.

Nova Scotia, 65°·7 on 5th at Sydney; 19°·0 on 13th at Truro.

Prince Edward Island, 60°·8 on 8th at Georgetown; 29°·9 on 19th at Charlottetown.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, OCTOBER, 1892.

	PRESSURE IN INCHES.			TEMPERATURE OF AIR.							Mean amount of cloud.	DIRECTION OF WIND FROM.							VELOCITY OF WIND.			PRECIPITATION.																
	Mean actual.	Highest.	Lowest.	Range.	Mean.	Diff. from average.	Years observed.	Highest.	Date.	Lowest.		Date.	Mean daily range.	Greatest daily range.	Mean temperature of dewpoint.	Mean relative humidity.	No. of days completely clouded.	N.	E.	S.	W.	N. W.	S. W.	C.	Total number of hours.	Mean, miles per hour.	Highest days.	Date and direction.	Amount.	in.	Diff. from average.	No. of fair days.	No. of days.	No. of fogs.	No. of Thunderstorms.			
ASSINIBOIA																																						
Medicine Hat.....	29.57	30.61	29.43	1.18	43.7	0.7	984.0	4	17.0	24	30.5	13.7					4	1	1	1	16	9	18	7	62		25.3	7.8	0.04	+0.39	4.27	3	0	0				
Edmonton.....	29.35	30.47	29.53	0.94	40.6	0.9	882.0	4	21.5	17	24.0	41.5					5	3	3	4	5	1	5	23	62		17.0	18.8	1.10	+0.49	6.25	1	0	0				
Battleford.....	40.0				40.0		81.0	4	18.0	24	25.7	45.0					4	1	2	4	1	1	5	8	26	62		21.0	31.1	0.13		5.26	0	0	0			
Oniskup.....	39.3	0.0	26.0	2.3	39.3	0.0	639.0	23	9.0	28	19.7	36.0					4	1	0	4	5	8	5	10	7	62		26.0	31.8	1.63	0.52	11.20	0	0	0			
Swift Current.....	30.63	30.58	29.49	1.09	42.4	2.7	682.4	4	16.6	30	25.3	39.0					5	1	3	3	2	15	4	15	11	62		30.1	21.8	0.12	-1.10	1.27	1	0	0			
Qu'Appelle.....	29.49	30.45	29.42	1.03	42.6	4.4	978.1	4	16.8	29	23.5	37.3					5	1	3	3	2	15	4	15	11	62		30.1	21.8	0.12	-1.10	1.27	1	0	0			
Gleichen.....					42.9		83.0	5	12.0	29	24.9	50.0					6	8	2	6	13	9	1	2	6	47			1.22		5.26	1	0	0				
Wallace.....					43.1	+5.0	882.0	4	15.5	29	27.9	49.0																	1.31	+0.57	6.25	0	0	1				
Indian Head.....					40.0	0.6	881.8	4	7.2	17	28.7	44.8					4	2	2	1	1	0	0	11	6	62		26.0	15.8	0.65	+0.34	5.26	0	0	0			
Calgary.....	30.01	30.56	29.36	1.20	48.9	8.1	882.0	19	30.0	31								0	6	0	9	0	21	0	57	0	93			0.10		2.29	7	0	2			
Chaplin.....					44.4		81.5	4	12.5	29	29.2	47.0																										
Saskatoon.....					42.2		82.1	4	11.0	22	27.6	53.7																		0.09		1.30	3	0	0			
Regina.....					44.3	3.3	883.0	6	11.0	29	24.8	48.0																	1.41	-1.00	8.23	1	0	0				
Glen Adelaide																																						
MANITOBA																																						
Minnedosa.....	29.96	30.48	28.84	1.64	39.0	3.4	977.1	3	13.9	29	25.0	47.6					5	6	3	7	4	0	1	5	30	62		23.7	17.8	2.30	1.07	9.22	2	0	1			
Winnipeg.....	29.99	30.52	29.14	1.38	41.1	2.7	1974.6	3	14.0	28	23.8	40.1					6	5	7	11	5	9						33.0	28.8	0.84	-0.87	9.22	2	2	1			
Portage la Prairie.....					45.6	3.5	680.0	5	20.0	23	22.4	44.0																	1.06	-0.64	9.22	0	0	6				
Hillview.....					43.5	4.3	781.0	5	14.0	29							3	6	3	6	29	5	7	6	14	32	0	93		3.33	2.20	3.28	4	0	1			
Elkhorn.....					43.6	2.3	282.0	5	13.7	29	24.9	47.3																	3.04	2.00	5.26	7	0	0				
Stony Mountain.....																																						
St. Albans.....	28.71	29.18	27.40	1.77	44.9	3.9	785.0	5	12.0	29	25.5	50.0																	1.64	+0.64	7.24	3	0	0				
Fort Osborne.....					42.8	5.1	674.0	3	17.0	29																												
Oak Bank.....					42.9	+3.6	772.0	3	11.0	28	24.7	44.0																	1.49	+0.41	8.23	0	1	0				
Fort Ellice.....																																						
Portage.....					44.1	4.3	377.0	5	15.0	29	23.7	43.0					5	3	16	8	12	18	7	6	10	16	0	93		0.87	-0.11	7.24	3	2	0			
Brandon.....					43.5	5.7	480.7	5	10.5	29	27.4	49.7					5	1	15	28	4	1	1	12	5	25	2	93		1.48	0.18	5.28	0	1	0			
Chanel Island.....																																						
ONTARIO																																						
Tindora.....					38.8	2.1	572.0	12	21.0	26																												
Savannah.....					40.7	5.1	673.0	12	16.0	26	20.1	38.0																										
Biscatasting.....																																						
North Bay.....																																						
Ignace.....																																						
Nipigon.....					39.8	3.0	665.0	6	20.0	31																												
Cartier.....					39.2	2.8	673.0	14	21.0	2																												
White River.....					36.9	1.1	669.8	14	17.0	2	21.0	40.2																										
Missanabie.....					40.8	3.0	660.0	3-13	28.0	27																												
Port Arthur.....					41.5	1.8	1268.5	5	22.5	30	18.4	31.5																										
Perry Sound.....					42.9	-0.9	1867.0	14	28.3	2	17.7	27.0																										
Sauguen.....					47.6	-	0.8	1871.0	18	28.6	2	16.0	58.5																									
Owen Sound.....					47.6	+1.6	1372.0	14	31.0	26	13.6	26.0																										
Ipsland.....					41.4	2.4	671.0	14	20.4	2	21.2	37.2																										
Durham.....					47.5	2.2	1074.0	14	27.0	27	16.5	29.0																										
Eramont.....					43.7	0.7	1270.0	14	25.0	10	18.6	33.0																										
Little Current.....					46.0	1.2	570.0	14	31.0	28	16.1	28.0																										
Spencetale.....					41.5	1.4	872.0	14	19.0	17	23.2	41.0																										
Whiteside.....					45.3	+2.1	970.2	11	27.5	6	18.7	30.7																										

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION, &c. — *Continued.*

[illegible]

ONTARIO—Continued.

Novar.....	41 6	1-2.5	5-70.4	11	20.4	2	21.7 38.7	.....	8	4	15	2	0	4	0	9	8	40	83	II	IV	28 N	3.67	+0.63 11.20	4	3	2		
Fort Francis.....	43.2	—	71.4 3.13	13	22.0	29	19.6 32.0	.....	4	0	7	0	0	0	18	23	33	12	0	93	II	IV	17 S	0.51	—	8.23 1	0	0	
Little Forks.....	50.2	8.6	2 86.7	13	20.7	29	27.7 41.2	49.5	89	4	0	7	0	0	0	18	23	33	12	0	93	II	IV	17 S	0.16	—	3.28 2	0	0
Minden.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Shannonville.....	46 6	2.9	3 72.0	11	30.0	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.70	—2.50 7.24	0	3	2		

QUEBEC:																														
Montreal.....	46.3	+	1-2 18.67.8	14	32.6	12	12.8 27.1	38.4	77	7	6	85	27	18	37	60	253	90	172	0	744	13.5	34.2	6	NW	1.57	—1.81 18.13	3	0	2
St Hyacinthe.....	45.8	0.0	2 39.0	14	25.0	12	16.6 27.0	.....	.....	6	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.74	—0.28 10.21	0	0	0
Andross, W. P.....	38.4	1-1	1 45.0	1	28.0	3	.....	.....	.....	.....	.....	19	13	8	4	5	2	6	36	0	93	.....	.....	.....	2.49	+0.60 15.16	0	0	1
Richmond.....	43.1	—	0 15.68.7	1	21.4	12	18.0 32.9	.....	.....	7	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.97	+0.03 16.15	2	0	2
Chenointh.....	40.1	—	0 5.16.58.5	2	23.3	18	15.6 29.3	.....	.....	8	4	2	18	0	5	0	1	0	59	0	85	III	VII	31NW	3.42	+0.00 14.17	3	0	0
Quebec.....	41.7	—	0.6 18.66.2	14	25.5	31	14.9 30.6	.....	.....	7	6	7	6	2	0	4	3	22	6	12	62	.....	26.3	29 N	1.63	—1.65 13.16	0	0	1
Levesville.....	13.7	—	2.8 2.67.3	15	24.5	19	16.6 32.5	7	6	1	2	0	1	2	3	33	10	21	73	III	VI	1 W	1.94	—	22.9	2	0	0
Esquimaun Point.....	30.1	—	19.0	6	9.0	14	19.24.9 32.0	3.98	—	10.21	0	0	0
Brome.....	41.4	—	1 9.11.68.0	15	29.0	12	14.6 29.0	.....	.....	5	7	1	6	0	2	8	39	17	14	6	93	2.4	9.4	1NW	3.91	—1.06 18.13	0	0	0
Parth Point.....	39.1	—	0.5 18.52.4	1	22.1	28	11.3 31.7	.....	.....	8	12	15	1	3	1	4	6	19	9	4	62	.....	38.0	1NW	1.40	—1.52 17.14	5	0	0
*Point des Monts.....
*Cap Chatte.....	39.8	—	0.2 9.58.0	3	31.0	31	.....	.....	.....	.....	.....	8	4	1	0	0	14	32	8	26	93	.....	.....	.....	3.58	+0.82 10.21	2	0	0
*Bicquet.....	39.8	—	0.9 10.19.0	2	32.0	31	.....	.....	.....	.....	.....	5	14	0	0	2	29	4	28	11	93	.....	.....	.....	0.87	—1.83 9.22	0	0	0
*Cap Margdale.....	38.7	—	0.9 10.18.0	16	30.0	31	.....	.....	.....	.....	.....	0	2	3	0	14	0	2	58	14	93	.....	.....	.....	5.61	+2.35 17.14	0	0	0

QUEBEC:

Montreal.....	29 31	30.47	29.46	1.01	46.3	+	1.2 18 67.8	14	32.6	12	12.8 27.1	38.4	77	7	6	85	27	18	37	60	253	90	172	0	744	13.5	34.2	6	NW	1.57	—1.81 18.13	3	0	2
St. Hyacinthe.....	45.8	0.0	2 69.0	14	25.0	12	16.6 25.0	.....	6	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anticosti, W. P.....	38.1	—	1.1 9.45.0	1	28.0	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond.....	43.1	—	0.1 15.68.7	1	21.4	12	18.0 32.9	.....	7	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicoutimi.....	40.1	—	0.5 16.58.5	2	23.3	18	15.6 29.3	8	4	2	18	0	5	0	1	0	59	0	85	III	VII	21 NW	1.97	+0.03 16.15	2	0	2	0	0	0	0	0	
Quebec.....	29.88	30.45	29.43	1.01	41.7	—	0.6 18.66.2	14	25.5	31	14.9 30.3	.....	6	7	7	6	2	0	4	3	22	6	12	62	.....	26.3	29 N	1.63	—1.65 15.16	0	0	1
Lennoxville.....	37.7	2.8	2.47.3	15	24.5	19	16.6 32.6	7	6	1	2	0	1	2	3	33	10	21	73	III	VI	1 W	1.94	—	22.9	2	0	0	0	0	0	0	
Esquimaux Point.....	30.1	—	—	19.0	6	9.0	14.9	24.9 32.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brome.....	41.4	—	1.9 11.56.0	15	29.0	12	14.6 29.0	5	7	1	6	0	2	8	39	17	14	6	93	2.4	9.3	1 NW	3.91	—1.06 18.13	0	0	0	0	0	0	0	0	
Father Point.....	29.80	30.38	29.15	1.23	39.1	—	0.5 18.52.4	1	22.1	28	11.3 21.7	8	12	15	1	3	1	4	6	19	9	4	62	38.0	1 NW	1.40	—1.52 17.14	5	0	0	0	
*Point des Monts.....	39.8	—	0.2 9.58.0	3	31.0	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Cape Chatte.....	39.8	—	0.9 10.19.0	2	32.0	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Bicquet.....	38.7	—	0.9 10.18.0	16	30.0	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Cape Magdalene.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NEW BRUNSWICK:

Frederton.....	29.81	30.45	29.36	1.09	42.5	—	1.6 19.65.5	14	22.8	13	17.1 30.4	34.8	73	6	6	4	6	1	1	8	25	34	6	93	8.0	17.6	22 NW	1.99	—1.51 15.16	6	6	2		
Chatham.....	41.3	—	1.8 18.58.7	14	24.4	13	13.6 30.6	.....	28.4	12	17.6 30.0	40.0	79	6	5	6	2	5	2	1	3	20	17	6	62	.....	16.0	1 NW	1.83	—2.14 15.16	0	0	0
Bathurst.....	29.76	30.21	29.46	0.75	45.4	—	1.7 18.62.0	14	25.0	12	20.6 34.0	.....	.....	6	5	3	17	9	4	6	12	0	46	2	93	III	VII	1 NW	2.23	—1.80 14.17	0	0	0
St. Andrews.....	29.81	30.40	29.34	1.06	41.8	—	1.1 18.67.7	11	28.2	13	15.5 22.5	.....	.....	4	5	4	8	0	1	4	0	3	24	18	62	.....	III	6 NW	1.64	—2.04 9.22	0	0	0
Grand Manan.....	29.84	30.40	29.35	1.05	46.5	—	0.1 18.47.1	14	32.5	13	12.5 22.5	.....	.....	6	4	8	0	2	5	6	4	21	11	5	62	.....	32.0	30 NW	1.49	—3.57 15.17	1	0	0
Point Lepreau.....	46.7	0.6	13.61.0	11	33.0	13	.....	.....	35.0	13	.....	.....	.....	5	0	25	10	0	2	2	13	12	14	6	78	II	IV	1 N	1.56	—1.88 9.22	0	0	2
St. John.....	41.8	—	0.8 32.55.0	14	29.0	13	10.8	.....	32.0	13	10.8	.....	84	6	—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. John (City).....	35.8	—	4.57.0	11	17.0	13	13.2 24.0	.....	17.0	13	13.2 24.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dorchester.....	39.9	—	0.9 20.36.0	15	24.0	23	16.4 21.0	24.0	23	16.4 21.0	6	11	0	0	0	0	0	0	0	27	1	31	62	II	III	6 NW	1.06	—2.37 4.27	1	0	0
Dalhousie.....		

NOVA SCOTIA:

Halifax.....	28.84	30.42	29.29	1.13	44.9	—	2.2 19.61.2	11	28.4	14	15.2 25.2
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NEWFOUNDLAND:

St. John's.....	29.58	30.06	28.89	1.17	45.2	—	0.1 20.70.0	6	32.0	17	11.3 25.0
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P. E. ISLAND:

Kilmahallig.....	43.6	—	1.5 14.59.6	15	31.1	18	13.2 29.4
Georgetown.....	45.3	—	2.1 3.00.8	8	30.0	13	10.3 23.0
Charlottetown.....	43.9	—	2.5 16.36.0	1	29.9	19	10.4 20.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

BRITISH COLUMBIA:

Esquimalt	48.8	—	0.4 2.61.1	3	35.2	16	10.7 21.5	47.3	93	7	4	20	10	9	17	28	6	39	2	64	186	5.0	14.7	30 SW	1.56	—	2.10 16.15	0	0	0	0	0	0
Agassiz	50.6	—	1.1 2.59.0	3	33.0	16	17.8 32.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barkerville	42.1	—	2.3 4.53.0	8	13.0	15	22.9 40.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Donald	41.3	—	—	71.0	2	18.0	17	22.2 41.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Glanet	39.5	—	—	58.0	5.7	21.0	19	13.4 22.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abbotsford	49.6	—	0.7 3.76.0	3	32.0	15.2	16.1 31.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Griffin Lake	45.8	—	—	72.0	1	25.0	17	12.4 23.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nanaimo	49.2	—	—	67.5	3	31.5	16	12.7 20.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spence's Bridge	49.6	—	0.9 4.84.0	3	33.0	17	15.4 34.0	42.5	76	7	6	0	3	32	1	2	5	4	0	31	78	6.1	14.0	12 W	0.98	—0.33 5.26	1	0	5	1	0	5	1

PRECIPITATION.

The rainfall during October has in general been considerably below the normal quantity, except in the Province of Manitoba when the excess is due to an important storm which occurred on the 16th and 17th accompanied by heavy rain and high wind, at some stations over two inches fell followed by light snow. On the Atlantic Coast 13 inches of rain fell at St. John's, Nfld., an amount due to no particular storm, twenty-eight days during the month being recorded as rainy to a greater or less extent.

The general distribution is as follows :—

In British Columbia the rainfall was in general, 2'61 in., or about 0'05 in. below the average.

In the North-West Territories, 0'66 in., about 0'24 in. below the average.

In Manitoba the rainfall was 1'70 in., or 0'68 in. above the average.

In Ontario West and South-West district, it was 1'91 in., or 0'90 in. below the average. In the North and North-West district it was 2'77 in., or 0'69 in. below the average. In the Central district it was 1'21 in., or 1'18 in. below the average. And in the East and North-East district it was 1'88 in., or 1'19 in. below the average.

In Quebec, it was 2'45 in. or 0'95 in. below the average.

In New Brunswick, it was 1'63 in., or 2'27 in. below the average.

In Nova Scotia, it was 4'00 in., or 1'23 in. below the average.

In Prince Edward Island, it was 4'47 in., or 0'23 in. below the average.

Rainfall 5 in. and upwards during month :—

British Columbia, Agassiz, 6'35 in.

Quebec, Cape Magdalen, 5'51 in.

Prince Edward Island, Georgetown, 5'47 in.

Nova Scotia, Pictou, 5'99 in.

Newfoundland, St. John's, 13'11 in.

Rainfall 1 inch and upwards in 24 hours :—

1. Chicoutimi, 1'40 in ; Cape Magdalen, 1'20 in.

4. St. John's, Nfld., 1'51 in.

5. Goderich, 1'00 in ; Anticosti, W. P., 1'44 in.

6. Esquimaux Point, 1'02 in ; Cape Magdalen, 1'90 in.

9. Port Hastings, 1'70 in.

10. St. John's, Nfld., 1'08 in.

12. Sarnia, 1'50 in.

13. Sarnia, 1'68 in ; Agassiz, 1'34 in.

14. Hillview, 1'01 in ; Bradwardine, 1'02 in ; Nicola Lake, 1'04 in.

15. St. John's, Nfld., 1'36 in.

16. Fairburn, 1'20 in.

17. Hillview, 2'22 in ; Elkhorn, 1'06 in ; Brandon, 1'70 in ; Fort Ellice, 2'15 in ; Turtle Mountain, 1'35 in ; Shoal Lake, 1'50 in ; Minnedosa, 1'02 in.

18. Blenheim, 2'30 in.

21. Pictou, 1'19 in.

22. St. John's, Nfld., 1'10 in.

26. Wyoming, 1'42 in ; Point Clark, 1'00 in ; Alexandria, 1'20 in.

28. Pictou, 1'38 in.

29. Wilton Grove, 1'10 in ; Thedford, 1'36 in ; Lyons, 1'10 in ; Goderich, 1'09 in ; Novar, 1'00 in ; Halburton, 1'10 in ; Bognor, 1'15 in ; Georgetown, P. E. I., 1'26 in ; Channel, 1'54 in ; Halifax, 1'40 in ; Sydney, 1'89 in ; Truro, 1'11 in.

30. Wiarton, 1'25 in ; Presque'Isle, 1'25 in ; St. John's, Nfld., 1'28 in.

Thunder recorded on :

2. Midland, Wiarton, Belleville, Presque'Isle, Posen, Uplands, Owen Sound, Lucknow, Bognor, Cartier.

3. St. Thomas, Burk's Falls, Wilton Grove, Georgetown, Cayuga, Thompson, Lion's Head, Belleville, Thedford, Wyoming, Presque'Isle, Gravenhurst, Stony Creek, Alton, Novar, Sprucedale, Beatrice, Egremont, Elora, Bancroft, Sombra, Peterboro', Owen Sound, Lucknow, Zurich, Ridgetown, Birnam, Paris, Bognor, Shannonville, Lindsay, Toronto.

4. Shannonville.
5. Cartier.
7. St. Thomas, Burk's Falls, Georgetown, Cowal, Mount Forest, Lion's Head, Thedford, Griffin Lake, B.C., Gravenhurst, Alton, Novar, Sprucedale, Egremont, Sombra, Whiteside, Owen Sound, Lucknow, Zurich, Ridgetown, Birnam, Point Clark, Georgina, Durham.
8. Sprucedale.
12. Posen.
14. French Creek, Georgina.
15. Burk's Falls, Midland, Presque'Isle, Gravenhurst, Alton, Novar, Sprucedale, Beatrice, Peterboro', Whiteside, Bognor, Shannonville, Little Current.
16. Treherne, Pembina Crossing, Winnipeg, Durham.
17. Brandon, Oakbank, Selkirk, Norquay.
18. Peterboro', Zurich.
19. Alexandria.
22. Uplands, Alexandria.
25. Alexandria.
26. Alexandria.

Snowfall.—Snow fell pretty generally about the 5th of the month to a small amount. In Manitoba and the N. W. Territories some heavy falls are recorded from the 15th to the 18th in some parts of these Provinces. The fall during the passage of a severe storm on the 16th and 17th was heavy and severely felt.

Snow one inch and upwards in 24 hours:—

5. Alton, 2 in.; Mattawa, 1 in.; Bognor, 1½ in.; Orangeville, 4 in.; Durham, 1 in.
13. Barkerville, 3 in.
15. Glenbow, 8 in.; Calgary, 1 in.
16. Calgary, 5 in.
17. Wallace, 9 in.; Bradwardine, 1 in.; Fort Ellice, 2 in.; Barkerville, 3 in.; Minnedosa, 3 in.
18. Rathwell, 3 in.; Shoal Lake, 6 in., *terrible storm*; Glen Adelaide, 3 in.; Griffin Lake, 1 in.
25. Cartier, 1 in.
27. Buda, 4 in.
28. Savanne, 7 in.; Oonikup, 1½ in.
29. Egremont, 1½ in.
30. Uplands, 1 in.
31. Glenbow, 1 in.

Aurora recorded—

Where the class of aurora is noted by the observer it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

1. Novar.
2. Father Point, III; Fredericton, IV.
4. Little Forks, IV.
5. Elora, Henrietta, III.
9. Port Arthur, II.
10. Father Point, III.
11. Richmond, III; Bancroft, I; Kingston, IV; St. Andrews, IV; Yarmouth, IV; Fredericton, IV.
12. Dorchester, N.B., Dalhousie, N.B., Chicoutimi, III; Buda, I; Savanne, Lucknow, Elora, Egremont, II; Gravenhurst, Hillview, Henrietta, I; Saskatoon, III; Georgetown, Ont., IV; Father Point, III; Fredericton, III; Spence's Bridge, IV; Toronto, IV; Truro, IV; Alexandria, IV; Wallace, II.
13. Uplands, Elora, Novar, IV; Saskatoon, IV; Glen Adelaide, Medicine Hat, III; Swift Current, III.
14. Elora, Truro, IV.
15. Truro, III.
16. Medicine Hat, II; Alexandria, II.
17. Cape Chatte, *very bright*; Dorchester, N.B., Richmond, III; Chicoutimi, IV; Savanne, Uplands, Sombra, III; Mattawa, Haliburton, Bancroft, III; Clontarf, IV; Novar, III; Gravenhurst, III; Pembina Crossing, IV; Beatrice, Kingston, III; Port Stanley, III; Edmonton, II; St.

Andrews, IV; Father Point, II; Yarmouth, IV; Grand Manan, IV; Fredericton, III; Lennoxville, IV; Ottawa, IV; Truro, III.

18. Cape Chatte, Dorchester, Fort Francis, III; Pembina Crossing, IV; St. Albans, III; Elkhorn, II; Saskatoon, II; Father Point, III; Medicine Hat, III; Fredericton, IV; Little Forks, II; Lennoxville, IV; Truro, III.

19. Savanne, Uplands, Egremont, IV; Novar, IV; Elkhorn, II; Kingston, IV.

20. Posen, IV; Elkhorn, II; Saskatoon, IV.

21. Winnipeg, Posen, III; Elkhorn, II; Saskatoon, I; Alexandria, III.

22. Dorchester, N.B., Chicoutimi, III; Hillview, Pembina Crossing, IV; Posen, II; Fort Ellice, II; St. Albans, II; Elkhorn, III; Minnedosa, III; Fredericton, IV.

23. Hillview, Pembina Crossing, IV; St. Albans, IV; Truro, III.

24. Pembina Crossing, IV; Saskatoon, IV.

26. Savanne, Winnipeg.

27. Henrietta, III; Saskatoon, IV; Minnedosa, III.

28. Pembina Crossing, IV; Fort Ellice, II; Elkhorn, III; Alexandria, II.

29. Hillview, Elkhorn, III.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF OCTOBER, 192.

HOURS ENDING																
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.
ESQUIMALT.....				0 16	0 23	0 30	0 39	0 40	0 53	0 58	0 46	0 35	0 16	0 00		
AGASSIZ, B.C.				00	10	37	45	54	53	57	53	40	10	9		
BRANDON.....				03	12	30	40	44	51	50	43	35	18	9		
INDIAN HEAD.....				04	14	62	65	67	64	65	62	55	25			
WINNIPEG.....			9	31	55	58	57	54	53	48	43	35	19	9		
WOODSTOCK.....				10	17	53	51	51	49	53	46	37	10			
TORONTO.....			04	36	57	63	60	58	61	55	53	44	32	10		
LINDSAY.....			06	31	47	56	64	56	51	47	45	30	25	13		
BARRIE.....			9	25	42	47	41	51	54	49	41	38	27	03		
KINGSTON.....			05	28	51	57	62	65	64	58	54	48	29	9		
MONTREAL.....			00	25	48	55	53	56	57	53	46	41	14			
FREDERICTON.....			9	30	46	53	51	54	52	45	39	41	29	9		
SYDNEY.....			01	22	34	44	57	41	46	48	40	38	23			
				ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH.....	0 33	0 32	0 30	0 48	0 43	0 30	0 48	0 43	0 38	0 48	0 43	0 38	0 47	0 47	0 43	0 34
(Constant sunshine being 1.)																
MAXIMUM DAILY AMOUNT.....	0 84	0 72	0 80	0 83	0 83	0 80	0 83	0 92	0 82	0 92	0 98	0 91	0 90	0 98	0 92	0 79
DATE.....	3	21	7	23	24	21	1	1	1	1	1	1	12	12	19	
NO. OF DAYS COMPLETELY CLOUDED.....	5	10	8	6	3	7	1	1	1	1	2	2	5	7	5	

STORM WARNINGS.

During the month warnings on the approach of six storms were issued to our agents and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 197, of which 160 or 85·8 per cent. were verified. At thirty-five stations, however, the force did not reach, and at 12 exceeded that indicated by the signals displayed; 11 stations reported warnings received late, 10 owing to delay in issue, and 1 to delay in transmission, and 2 stations reported a storm for which no warning was sent.

In connection with the warnings, predictions as to probable directions of the wind were given and of the 169 warnings verified as to force, 138 or 81.7 per cent., were fully verified, and 155 or 91.1 per cent., were fully and partially verified.

No. 1. At 10.30 a.m. on the 3rd, all Lake Stations were warned to expect a moderate gale from the S.W. shifting to the N.W., at the time a moderate depression was over the Lakes showing signs of development. At 4 p.m. all stations from Quebec east and south along the Gulf coast as far as Chatham, were also warned for a moderate S.E. to S.W. gale. During the 3rd the depression increased in energy, and a moderate gale set in over the Lakes from the directions predicted. It increased at some parts of the Georgian Bay to a fresh gale from the N.W. During the night of the 3rd and morning of the 4th, a moderate to fresh gale set in over the upper part of the Gulf of St. Lawrence and continued till the 6th, the winds backing from E. through N. to N.W. The depression moved eastward to the New England Coast, and then took a northerly course across the Gulf of St. Lawrence.

No. 2. At 10 p.m. on the 6th, all Lake Stations were warned for a moderate N.W. to N. gale in advance of a depression then over Manitoba. Next morning it was central over Michigan and had increased in energy, and signals were changed to No. 4 for a heavy N.W. to N. gale. Most Stations reported a moderate S.W. to N.W. gale, but the S. S. Pacific experienced a very heavy blow on the Georgian Bay. The cyclone after passing the Lakes dispersed over Eastern Canada.

No. 3. Lake Superior Stations were warned at 11 a.m. on the 15th, at first for a moderate W. to N. storm, and then on the morning of the 16th for a heavy W. to N. gale. This was owing to a heavy storm over the N.W. states which passed across Manitoba on the 17th, and dispersed to the N.E. of Lake Superior. Its southern portion crossed Lake Superior on the 17th, giving a moderate to fresh S.E. to S.W. gale on that Lake on the 17th. Lake Huron and Georgian Bay Stations were also warned for a moderate S.W. gale. After the passage of the lower portion of this depression across these Lakes a moderate westerly gale blew in this district during the 19th.

No. 4. All stations in the Gulf of St. Lawrence were warned at 10 a.m. on the 16th for a moderate N.W. to N. gale, owing to expected steep gradients being formed by an approaching anti-cyclone from the west. A moderate N. to N.W. gale was reported during the 16th and 17th on the western side of the Gulf, elsewhere there was no storm. The anti-cyclone moved southward with diminished energy.

No. 5. At 11 a.m. on the 28th, all Lake Stations were warned for a heavy gale. On Lake Superior from the N. to W., and on the rest of the Lakes from the S. to W. and N.W., in advance of a cyclone then developing over Lake Superior. During the 28th a S.W. gale set in over the Lakes, which next day increased to a heavy gale, the wind veering to N.W. At Bayfield it blew a hurricane, at Goderich a velocity of 68 miles per hour was recorded, and at Pelee Island the wind averaged over 50 miles per hour from 11 p.m. on the 28th until 10 a.m. on the 29th, the highest velocity being 71 miles per hour. By the evening of the 28th another cyclone had appeared off the New England Coast and in consequence of these two cyclones all stations in Eastern Canada were warned for a strong easterly gale. The eastern cyclone passed quickly northeastward causing a northeasterly gale in the eastern portions of Nova Scotia, and on the Cape Breton Coast during the 19th. The western cyclone decreased in energy before reaching the Gulf of St. Lawrence and no storm occurred there.

No. 6. At 11 a.m. on the 31st, all stations on Lakes Superior and Erie were warned for a strong gale from the N.E. on Superior and S.E. on Erie. This was in consequence of a depression which was moving towards the Lakes from the southwest. By night it was central over Iowa, and the Georgian Bay and Lakes Huron, and Ontario Stations were warned for a strong E. to N. and N.W. gale. During November 1st a fresh gale from the E. and N.E. occurred on the Georgian Bay and Lake Ontario, and a moderate gale on Lakes Erie and Huron from the same directions. No storm was reported from Lake Superior Stations.

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 634. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
MANITOBA	98	73	10	15	79.6
LOWER LAKE REGION	117	93	16	8	86.3
UPPER ST. LAWRENCE	113	85	14	14	81.4
LOWER ST. LAWRENCE	102	75	14	13	80.4
GULF.....	90	60	11	19	75.3
MARITIME PROVINCES	105	84	13	8	86.2
TOTAL	634	479	78	77	81.7

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions, the reports from the agents at the "Probability" stations, as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer R. F. Stupart.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR OCTOBER, 1892.

The 1st day of the month was comparatively free from disturbance. The following day was not so quiet, and slow waves of disturbance was registered on the night of the 2nd and next morning. Disturbing action appeared on the 5th after 4 a.m., and continued up to the morning of the 7th; there was nothing of importance recorded. During the night of the 7th a small disturbance sprang up, and at 2 a.m. of the 8th it passed off. A disturbed period set in on the 10th and continued to the morning of the 16th; the changes during the 12th, especially in the night hours, were the most conspicuous. The h. f. was below its normal on the night of the 12th, and a steady recovery commenced after 2 a.m. of the 13th. Early on the 15th an increased activity appeared, the declination magnet began moving in slow swings. About 5 a.m. the magnet trended west, and after 6 a.m. rapid oscillations began. The v. f., after midnight of the 14th, commenced to decrease, and in about half an hour the change was considerably augmented; after 6 a.m. a recovery set in. The changes were not so prominent on the horizontal force curve. During the afternoon and evening of the 15th the movements became considerably reduced, but after 8 p.m. a bold easterly sweep of the declination magnet occurred, the change being 35', a marked minimum was registered at 8.57 p.m.; the magnet then slowly returned to its normal position. Slight disturbances continued to 9 a.m. of the 16th, when a remarkably steady magnet set in and an entire absence of disturbance prevailed up to the morning of the 17th, when slight irregularities occurred, and during that night and next morning a moderate storm was recorded. A little after 10 p.m. some rapid swings of the declination magnet were noticed, also a little after midnight and 3 a.m. of the 18th. The magnet was considerably west of its mean reading on the early morning of the 18th. A marked westerly extreme occurred at 6.10 a.m., the easterly extreme taking place at 10.15 p.m. of the 17th, the range being 59'.4. On the evening of the 17th the v. f. was above its normal value, and after 8 p.m. a decrease began and it remained below its normal value until 6 a.m. next day. The h. f. on the night of the 17th and morning of the 18th was changing considerably, but there were no large departures from the normal.

A slight disturbance was maintained from 7 a.m. of the 18th to the morning of the 24th, the magnets being seldom at rest. A quiet period then set in and there was nothing of importance to the end of the month.

Auroral light observed on the 12th, 10.30 to 11.30. On the 1st, 5th, 6th, 7th, 9th, 10th, 14th, 15th, 19th, 21st, 24th, 26th, 27th and 29th, the sky was clear but no auroras were observed; on all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL

Director.

METEOROLOGICAL OFFICE,

Toronto, December 21st, 1892.

Monthly Weather Review.

NOVEMBER, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraph reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraphic reporting stations, was slightly above the normal of eighteen years at all stations east of Winnipeg with the exception of those on the Bay of Fundy.

The morning of the 1st opened with the pressure generally above its average throughout Canada, and with a shallow depression covering the Mississippi Valley. The weather was nearly everywhere unsettled, and in many places showers of rain or sleet occurring.

The depression, while it was passing to the Atlantic, gave on the 1st and 2nd a moderately heavy rainfall in Ontario, as well as sleet and rain in Quebec. It also caused during the night of the 2nd and on the 3rd a pretty heavy rain in the Maritime Provinces.

In the North-west Territories and Manitoba the 1st and 2nd were fair, mild days, but the passage of a shallow disturbance on the 3rd gave light, local falls of sleet or snow.

The disturbance after traversing the Lake Region developed much greater energy as it approached the Atlantic Coast. It caused between the 3rd and 5th rain generally, as well as snow in portions of Ontario and Quebec, and taken in conjunction with a high pressure area, which apparently formed in its rear to the northward of Manitoba, the winds as they shifted to westerly and northerly increased to strong breezes and gales from Lake Superior to the Maritime Provinces inclusive, and the weather became somewhat colder.

An area of low pressure which first appeared in the North Saskatchewan Valley on the evening of the 3rd, during the two following days gave occasional rains as far as Manitoba. The rain turned to snow early on the 6th, and during the day as the depression passed a little to the southward, a very heavy gale prevailed in Manitoba. It was afterwards accompanied between the 7th and 8th by a fall of rain from the Lakes to the Atlantic together with a southerly to westerly gale, the latter being severely felt on the Georgian Bay and Lakes Huron and Superior.

Fine cold anti-cyclonic weather prevailed in the North-west on the 7th and 8th, minima of -18 occurring in North-western Manitoba. The high pressure and fine weather reached the Lakes and Eastern Canada on the 8th, but only a few degrees of frost were recorded in most localities.

10th-20th.—This protracted interval comprised the most general stormy period of the month from our Pacific to our Atlantic seaboard, as many as eight areas of depression of more or less importance travelled over or affected some portion of Canada, and the weather as a consequence was, as a rule, very unsettled. On the 10th there was a fall of snow on the Lakes and the St. Lawrence, while in the Maritime Provinces strong winds and gales were experienced with heavy rains (Halifax 2.48 inches.) Showers of rain or snow occurred from the Lakes to the Atlantic on the 11th and 12th. On the 14th there were showers in the Lake Region accompanied by a southerly to westerly gale; again on the 15th and 16th there were showers. On the latter date also heavy rains fell in the St. Lawrence and Maritime districts, and at the same time an easterly gale prevailed. On the 17th the most important depression of the eight approached the Lake Region from the South-west States, and between this date and the 19th it brought an easterly to westerly gale from the Lakes to the Atlantic, together with rain, which was heavy in many places, especially in

the Maritime Provinces (Halifax 2.14 inches.) In some portions of Ontario and Quebec the rain turned to light snow. On the 20th heavy rains again fell along the Nova Scotian Coast, Halifax 1.44 inches, Charlottetown 1.04 inches.

In the North-west Territories and Manitoba there were light local showers on the 10th, a fall of snow or sleet on the 12th and again more locally on the 15th. On the 14th and 15th light snow or sleet was accompanied by strong winds and gales, and on the 19th a fall of snow, heavy in many localities, occurred from the Rockies to Manitoba.

An anti-cyclonic system developed on the 20th over the North-west Territories, and quickly became of great importance, the barometer in its centre when over Manitoba on the 22nd being 30.98 inches. It was attended by decidedly cold weather, minima being recorded ranging from -8 in Alberta to -24 in Manitoba. This important system spread at first quickly eastward, its advent into Ontario being heralded during the night of the 21st by strong winds and gales from the westerly and north-westerly and by colder weather, with light local snowfalls. It also brought on the 22nd colder weather in Quebec, as well as light snowfalls, but in the Maritime Provinces, apparently owing to the persistent hovering of a disturbance over the Coast, the weather remained mild, and up to the 26th it was mostly unsettled, with light falls of rain or sleet.

The 23rd and 24th were fair, cold days in Ontario and Quebec, accompanied by a continuance of light local snow, minima were recorded within a few degrees of zero in Muskoka and the Ottawa Valley.

The last few days of the month, from the Lakes to the Atlantic, were comparatively mild, and the weather was generally fair except that a fall of snow occurred in the Lower Lake Region during the night of the 27th and on the 28th, chiefly confined to the southern portion, and again on the 30th the passage of an area of low pressure from the Atlantic caused an easterly gale in the Maritime Provinces, with snow turning to rain.

The distribution of pressure over the North-west Territories and Manitoba from the 30th, and until the end of the month, was for the most part anti-cyclonic, and it was as a rule decidedly cold, minima below zero were of almost daily occurrence, and at intervals it was more than twenty degrees below. The weather was on the whole fine, except that during the passage of a disturbance which had previously moved south-easterly across British Columbia, there was a considerable fall of snow in Alberta on the 22nd and 23rd, and from Saskatchewan to Manitoba between the 24th and 25th.

The month in British Columbia taken as a whole may be characterized as very unsettled, more so, perhaps, near to and on the Coast, where rain fell almost daily and often in large quantities. Agassiz records as much as 14.40 inches, Esquimalt 10.30 inches, and Abbotsford 10.40 inches. Gales occurred along the Coast on the 5th, 12th, 14th and 19th.

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations, was above the normal of eighteen years in Quebec and the Maritime Provinces, but below the normal in Ontario, Manitoba and the North-west Territories. The greatest excess was over the Gulf of St. Lawrence, and amounted to between 3° and 4° , and the greatest defect was near the Rocky Mountains, and amounted to from 8° to 10° .

November

The highest and lowest Temperatures in each Province during October were:

British Columbia, $66^{\circ}.0$ on 3rd at Barkerville ; $-15^{\circ}.0$ on 25th at Barkerville.

North-west Territories, $68^{\circ}.3$ on 4th at Calgary ; $-28^{\circ}.9$ on 27th at Henrietta.

Manitoba, $43^{\circ}.9$ on 2nd at Winnipeg ; $-24^{\circ}.1$ on 22nd at Minnedosa.

Ontario, $70^{\circ}.0$ on 2nd at Pelee Island ; $-28^{\circ}.5$ on 23rd at Little Forks.

Quebec, $66^{\circ}.0$ on 18th at Richmond ; $8^{\circ}.0$ on 28th at Father Point.

New Brunswick, $62^{\circ}.9$ on 19th at Chatham ; $12^{\circ}.0$ on 12th at Dorchester.

Nova Scotia, $68^{\circ}.6$ on 8th at Pictou ; $17^{\circ}.7$ on 7th at Truro.

Prince Edward Island, $59^{\circ}.7$ on 19th at Charlottetown ; $20^{\circ}.8$ on 7th at Kilmahumaig.

ONTARIO—Continued.

Novar.....	26.5 — 0.6	5.48.9	16	1.0	20	12.4	24.2	.....	9	20	6	4	5	7	6	19	23	83	II	III	8W	3.66	—1.08	15.15	0	2	9		
Fort Francis.....	15.6 —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.00	—	—	8.22	0	2		
Minden.....	15.5 — 8.1	2.38.0	2	—28.5	23	20.4	2.5	30	4	2	48	1	1	0	7	6	12	14	0	90	II	IV	7N	0.63	—3.36	5.25	2	0	0
•Little Forks.....	32.5 — 2.0	3.55.0	15	15.0	21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.40	—1.92	5.25	0	0	0			
Shannonville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

QUEBEC:

Montreal.....	33.0 — 0.7	18.63.7	18	15.5	23	10.6	25.2	27.8	81	9	7	82	66	11	114	38	120	90	197	0	720	11.6	38.4	8SW	3.70	—0.02	17.13	0	0	0	
St. Hyacinthe.....	33.4 + 0.1	2.65.0	18	16.0	6	11	16	30	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.38	+3.52	16.14	0	0	0	
Roberval.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond.....	32.2 + 1.4	15.68.0	18	8.3	29	15.0	20.5	.....	.....	8	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicoutimi.....	28.3 + 1.5	16.17.4	9	12.7	11	14.0	25.0	.....	.....	4	4	2	30	0	3	0	0	52	0	87	10	.....	.....	.....	2.94	—1.50	17.13	1	0	0
Quebec.....	28.3 + 1.5	16.17.4	9	12.7	11	14.0	25.0	.....	.....	4	4	2	30	0	3	0	0	52	0	87	10	.....	.....	.....	1.14	—0.86	9.21	1	0	0
Chicoutimi.....	31.4 + 2.5	18.61.5	19	15.5	6.24	.....	.....	.....	.....	8	15	6	9	8	0	4	5	10	2	16	60	35.2	16NE	1.98	—1.99	20.10	1	0	0	
Lemieuxville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grimsstone.....	38.1 —	—	52.0	6.15	20	27.0	7.25	8.3	17.0	9	15	11	3	5	13	3	5	11	4	0	60
Brome.....	33.2 + 1.3	11.67.0	18	11.0	6	10.5	25.0	.....	.....	6	13	12	9	8	11	11	18	50	1	0	90	1.9	7.9	18E	3.32	+0.89	17.13	0	0	0
Father Point.....	31.6 + 1.7	18.61.0	19	8.0	28	13.8	26.0	.....	.....	8	16	9	5	9	2	11	9	8	3	4	60	.....	.....	.....	1.13	+1.42	19.11	0	0	0
Point des Monts.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....
•Cape Chatte.....	34.1 + 3.9	10.57.0	19	21.0	10
.....
•Biequet.....	33.3 + 3.4	10.52.0	18	22.0	10
•Cape Margulene.....	32.8 + 2.6	10.53.0	19	22.0	2.7

QUEBEC:

Fredericton.....	30.00	30.52	29.42	1.10	33.0	—	2.0	19.61.7	19	12.2	12	11.2	24.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chatham.....	30.01	30.51	29.44	1.10	34.5	+	3.7	18.62.9	19	15.7	12	11.2	24.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bartholst.....	29.56	30.55	29.49	0.86	39.6	—	6.8	18.61.0	19	15.0	12	18.2	31.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Andrews.....	29.99	30.46	29.52	0.91	37.5	—	1.7	18.59.2	17	17.8	21	13.2	23.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Manan.....	29.99	30.47	29.49	0.70	37.5	+	1.9	19.58.8	17	26.0	7	9	10	4	5	8	8	11	1	60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Point Lepreau.....	.....	.....	.....	.....	38.1	—	1.1	17.52.0	19	22.0	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. John.....	30.01	30.48	29.52	0.96	37.5	—	2.1	32.51.0	19	22.0	12	9.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. John (City).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dorchester.....	.....	.....	.....	.....	30.0	—	3.9	4.55.0	19	12.0	12	9.6	31.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dalhousie.....	.....	.....	.....	.....	32.4	—	1.3	20.53.5	19	15.0	10	13	52.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NOVA SCOTIA:																																			
Halifax.....	30.02	30.51	29.44	1.07	39.5	—	3.1	18.61.0	19	23.8	25	12.2	25.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sydney.....	30.01	30.52	29.41	1.11	40.0	—	3.1	18.62.6	19	25.8	24	10.2	20.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yarmouth.....	30.00	30.47	29.48	0.99	40.4	—	9.5	12.61.0	16	26.3	11	13	12	11	1	6	5	4	8	60
Truro.....	30.03	30.55	29.51	1.04	38.8	—	1.8	19.65.4	19	17.7	7	11.0	29.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pictou.....	.....	.....	.....	.....	41.9	—	3.6	19.68.6	8	23.0	25	13.3	27.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Digby.....	.....	.....	.....	.....	39.1	—	2.1	12.62.0	19	26.0	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Whitehead.....	.....	.....	.....	.....	41.5	+	1.6	9.55.0	8	33.0	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Hastings.....	.....	.....	.....	.....	39.4	—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NEW BRUNSWICK:

St. John's.....	30-02	29-61	29-30	1-34	37-11	+	0-9	29-57-00	8-9	25-0	3	9-7	24-0	7	9	6	11	3	5	13	5	3	11	0	66	35	0	25	NW	0-53	1-12	21	9	0	0
P. E. ISLAND :																																					
Kilnashinaght.....	.....	.....	.....	.....	37-5	+	3-2	14-59-5	20	20	8	7	11-7	25-1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgetown.....	.....	.....	.....	.....	40-0	+	1-9	3-59-4	19	26-0	25	25	8-6	21-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charlottetown.....	.....	30-60	30-48	29-52	0-96	38-8	+	3-6	6-59-7	19	26-2	25	9-4	21-6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
BRITISH COLUMBIA :																																					
Esquimalt.....	.....	.....	.....	.....	43-9	—	1-7	2-53-1	3-5	30-3	25	7-4	11-9	11-4	93	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quamichan.....	.....	.....	.....	.....	44-3	+	1-2	7-60-0	1	25-0	16	15-2	21-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quamichan.....	.....	.....	.....	.....	22-8	—	4-9	5-65-0	3	—15-0	25	15	8	37-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barkerville.....	.....	.....	.....	.....	48-6	—	4-0	3-56-0	1	16-9	26	7-7	18	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Agassiz.....	.....	.....	.....	.....	26-3	—	.....	—18-0	1	8-0	25	10-7	20	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Donald.....	.....	.....	.....	.....	40-0	—	5-1	3-55-0	1-10	21-0	25	9-7	16-0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abbotsford.....	.....	.....	.....	.....	34-4	—	2-6	5-62-0	2	2-0	27	13-6	22-1	32-0	85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spence's Bridge.....	.....	29	32	30-39	29	11	0-98	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Simpson.....	.....	29-67	30-23	29	02	1-21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nanaimo.....	.....	.....	.....	.....	42-4	—	.....	—55-2	13	28-1	16	8-5	15-8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Griffin's Lake.....	.....	.....	.....	.....	32-6	—	.....	—30-0	4	12-0	25	9-0	18	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NOVA SCOTIA:

Halifax.....	30.02	30.51	29.44	1.07	39.5	—	2.1	18.61.0	19	23.8	25	12.2	25.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sydney.....	30.01	30.52	29.41	1.11	40.0	—	1.1	18.62.6	19	25.8	24	10.1	30.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yarmouth.....	30.00	30.47	29.48	0.99	40.4	—	0.5	12.61.0	16	26.3	12	10.9	21.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trenton.....	30.03	30.55	29.51	1.04	38.8	—	1.8	19.65.4	19	17.7	7	11.0	29.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pictou.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Digby.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Whitehead.....	41.31	—	1.6	9.53.0	8	33.0	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Hastings.....	39.4	—	—	61.0	9.21	25.0	28	12.8	24.0

NEWFOUNDLAND:

St. John's.....	30.02	30.51	29.40	1.34	35.1	—	0.9	20.57.0	8.9	25.0	3	9.7	24.0
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P. E. ISLAND:

Kilmichael.....	
Georgetown.....	
Charlottetown.....	30.60	30.48	29.52	0.96	38.8	—	3.6	6.59.7	19	26.2	25	8.6	21.0

BRITISH COLUMBIA:

Esquimalt.....	43.9	—	1.7	2.53.1	3.5	30.3	25	7.4	11.9	11.4	93	8	7	29	7	19	11	35	22	14	7	35	180	8.3	20.7	14SW	10.31	—3.70	28.2	0	0	0	0	0	0	0
Victoria.....	44.3	—	1.2	7.60.0	1	26.0	16	15.2	21.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Qualicum.....	22.8	—	4.9	5.65.0	3	—	15.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Backerville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Agassiz.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Donald.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abbotsford.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spencer's Bridge.....	34.4	—	2.0	5.62.0	2	2.0	27	13.6	22.1	32.0	85	7	3	0	1	24	3	2	3	11	0	34	78	4.7	20.7	23E	2.56	—1.57	13.17	0	0	2	0	0	0	0
Fort Simpson.....	29.67	30.23	29.02	1.21	37.2	—	3.2	7.61.5																												

PRECIPITATION.

The rainfall has exceeded the average except in western and northern district of Ontario and in the Province of Quebec. The amount in parts of the Maritime Provinces and in British Columbia has been largely in excess of the normal ; this is true as well with reference to the number of days on which rain fell as to the amount, few heavy rain storms occurred, but the succession of cloudy drizzling days made some observers note it as the most dismal November in their experience. *The general distribution is as follows :—*

In British Columbia the rainfall in general was 5'10 in., or about 1'34 in. above the average. In the interior little or no rain has fallen.

In the North-West Territories the rainfall was 0'13 in., or about double the average quantity.

In Manitoba the rainfall was 0'23 in., or about double the average quantity.

In Ontario West and South-West district, it was 2'08 in., or 0'09 in. below the average. In the North and North-West district it was 1'76 in., or 0'10 in. below the average. In the Central district it was 2'29 in., or 0'37 in. above the average. And in the East and North-East district it was 2'25 in., or 0'45 in. above the average.

In Quebec, it was 1'64 in. or 0'06 in. below the average.

In New Brunswick, it was 3'76 in., or 0'51 in. above the average.

In Nova Scotia, it was 6'09 in., or 1'75 in. above the average.

In Prince Edward Island, it was 4'83 in., or 1'84 in. above the average.

Rainfall 5 in. and upwards during month :—

British Columbia. Abbotsford, 9'90 in. ; Quamichan, 5'60 in. ; Agassiz, 14'40 in. ; French Creek, 7'91 in. ; Nanaimo, 7'18 in. ; Fort Simpson, 8'39 in. ; Esquimalt, 10'25 in.

New Brunswick.—Point Lepreaux, 5'67 in. ; St. John, 5'56 in. ; Grand Manan, 6'26 in.

Nova Scotia.—Halifax, 9'18 in. ; Sydney, 5'19 in. ; Yarmouth, 6'85 in. ; Truro, 7'23 in. ; Sable Island, 6'22 in. ; Cow Bay, 6'55 in. ; Whitehead, 7'70 in.

Charlottetown.—Georgetown, 5'48 in.

Newfoundland.—Channel, 6'32 in. ; St. John's, 6'47 in.

Rainfall 1 inch and upwards in 24 hours :—

1. Alton, 1'29 in. ; Dealtown, 1'20 in. ; Sarnia, 1'00 in. ; Watford, 1'07 in. ; Fort Simpson, 1'28 in.

2. De Cewsville, 1'15 in. ; Stoney Creek, 2'00 in. ; Cayuga, 1'00 in. ; Scarboro', 1'11 in. ; Aurora, 1'16 in. ; Thedford, 1'00 in. ; Wyoming, 1'10 in. ; Paris, 1'32 in. ; St. Mary's, 1'08 in. ; Alexandria, 1'15 in.

3. Dalhousie, 2'00 in. ; Sable Island, 2'40 in. ; Coldwater, 1'19 in.

5. Agassiz, 1'07 in.

8. Cartier, 1'25 in. ; Channel, 1'08 in.

9. Agassiz, 1'52 in.

10. Point Lepreaux, 1'65 in. ; Digby, 2'00 in. ; Pictou, 1'53 in. ; Port Hastings, 1'05 in. ; Wyoming, 1'00 in. ; Georgetown, P. E. I., 1'51 in. ; Halifax, 1'85 in. ; Grand Manan, 1'48 in. ; Yarmouth, 1'99 in.

11. Abbotsford, 1'19 in.

12. Agassiz, 1'64 in.

16. St. Hyacinthe, 1'00 in. ; Cartier, 1'20 in.

17. Thompson, 1'08 in. ; Sarnia, 1'10 in. ; Belleville, 1'25 in. ; Warton, 1'40 in. ; Channel, 1'00 in.

18. Agassiz, 2'06 in. ; Abbotsford, 1'84 in. ; Nanaimo, 1'84 in. ; Digby, 1'00 in. ; Norwood, 1'45 in. ; Shannonville, 1'00 in. ; Port Hope, 1'07 in. ; Ottawa, 1'09 in.

19. Quamichan, 1'40 in. ; Agassiz, 1'53 in. ; French Creek, 1'74 in. ; Point Lepreaux, 2'10 in. ; Port Hastings, 1'00 in. ; Grand Manan, 1'70 in. ; Chatham, 1'38 in. ; Yarmouth, 1'40 in. ; Fredericton, 1'37 in. ; Channel, 1'10 in. ; Bathurst, 1'40 in.

20. Pictou, 1'63 in. ; Sable Island, 1'82 in. ; Kilmahumraig, 1'61 in. ; Port Hastings, 1'00 in. ; Dorchester, 1'03 in. ; Georgetown, P. E. I., 1'81 in. ; Charlottetown, 1'88 in. ; Halifax, 2'19 in. ; Sydney, 1'02 in. ; Truro, 3'47 in. ; Channel, 1'55 in. ; Point Escuminac, 1'12 in.

21. Whitehead, 1'23 in. ; Port Hastings, 1'00 in. ; Halifax, 1'31 in.

22. Port Hastings, 1'80 in.

27. Quamichan, 1'10 in.

30. Nanaimo, 1'00 in.

SNOWFALL.—The snowfall in the Northern District of Ontario and in P. E. Island was below the normal ; in Manitoba, N. W. Territories and British Columbia the fall at many places was very large. The distribution is as follows :—

In the same Districts of Ontario as shown in the rainfall the amounts are 9'6 in., or 0'9 in. above the average ; 13'5 in., or 1'4 in. below the average ; 9'4 in., or 3'4 in. above the average ; 10'8 in., or 2'6 in. above the average.

In QUEBEC it was 14'8 in., or 2'4 in. above the average.

In N. BRUNSWICK it was 9'0 in., or 0'4 in. above the average.

In NOVA SCOTIA it was 3'7 in., or 0'5 in. above the average.

In P. E. ISLAND it was 2'1 in., or 6'2 in. below the average.

In MANITOBA it was 17'2 in., or about 12'0 in. above the average.

In the N. W. TERRITORIES it was about 15'5 in., or 8'5 in. above the average.

In B. COLUMBIA the fall varied from 1'5 in. on the coast to 42'8 in the interior, or about 13 in. above the average.

Snow fall 6 inches during month.

BRITISH COLUMBIA.—Barkerville, 17 in.; Griffin Lake, 37 in.; French Creek, 6 in.; Nicola Lake, 12 in.; Donald, 43 in.; Spences Bridge, 23 in.

N. W. TERRITORIES.—Edmonton, 17 in.; Swift Current, 16 in.; Medicine Hat, 11 in.; Qu'Appelle, 13 in.; Calgary, 13 in.; Glenbow, 11 in.; Chaplin, 8 in.; Saskatoon, 12 in.; Henrietta, 30 in.; Oonikup, 32 in.; Glen Adelaide 14 in.; Banff, 32 in.

MANITOBA.—Winnipeg, 20 in.; Minnedosa, 22 in.; Brandon, 17 in.; Oakbank, 16 in.; Pilot Mound, 14 in.; Rathwell, 12 in.; Turtle Mountain, 17 in.; Brandon Exp. Farm, 15 in.; Posen, 16 in.; Fort Ellice, 14 in.; Hillview, 24 in.; Elkhorn, 18 in.

ONTARIO.—Parry Sound, 13 in.; Saugeen, 15 in.; Port Stanley, 11 in.; Kingston, 14 in.; Rockcliffe, 12 in.; Coldwater, 13 in.; Lindsay, 14 in.; Port Arthur, 11 in.; Whiteside, 7 in.; Egremont, 11 in.; Goderich, 11 in.; Novar, 15 in.; Shannonville, 10 in.; Fort Francis, 20 in.; Lakefield, 9 in.; Orillia, 13 in.; Collingwood, 10 in.; Welland, 11 in.; Gravenhurst, 12 in.; Stoney Creek, 6 in.; Birnam, 26 in.; Brantford, 8 in.; Ridgetown, 9 in.; Lucknow, 22 in.; Peterboro', 13 in.; Sharon, 12 in.; Haliburton, 6 in.; Mattawa, 12 in.; Sombra, 12 in.; Clontarf, 19 in.; Zurich, 9 in.; Bognor, 19 in.; De Ceusville, 8 in.; Niagara Falls, S., 11 in.; Sault St. Marie, 10 in.; Norwood, 15 in.; Beatrice, 9 in.; Alton, 11 in.; St. Marys, 12 in.; Bancroft, 17 in.; Uplands, 17 in.; Sprucedale, 16 in.; Point Clark, 6 in.; St. George, 7 in.; Toronto, 6 in.; Chatham, 9 in.; Buda, 22 in.; Owen Sound, 16 in.; Burk's Falls, 9 in.; Cowal, 12 in.; Oliver Ferry, 7 in.; Ennismore, 7 in.; Thompson, 8 in.; Fergus, 9 in.; Midland, 9 in.; Barrie, 14 in.; Denbigh, 16 in.; Wilton Grove, 12 in.; Mount Forest, 14 in.; Coldstream, 28 in.; Orangeville, 17 in.; Port Hope, 6 in.; Sarnia, 10 in.; Cayuga, 9 in.; Aurora, 11 in.; Sunshine, 16 in.; Belleville, 8 in.; Presque Isle, 15 in.; Wiarton, 17 in.; Glastonbury, 8 in.; St. Thomas, 14 in.; Thedford, 18 in.; Georgetown, 7 in.; Wyoming, 8 in.; Nepigon, 18 in.; Savanne, 10 in.; Cartier, 17 in.; Durham, 16 in.; Alexandria, 13 in.

QUEBEC.—Montreal, 22 in.; Father Point, 21 in.; Chicoutimi, 7 in.; Brome, 9 in.; Richmond, 14 in.; Cape Magdalene, 6 in.; Bicquet, 22 in.; St. Hyacinthe, 26 in.; Quebec, 6 in.

N. BRUNSWICK.—Dalhousie, 9 in.; Chatham, 18 in.; Fredericton, 9 in.; Point Eseuminac, 7 in.; Bathurst, 10 in.

N. SCOTIA.—Pictou, 6 in.

Snow four inches and upwards in 24 hours:—

2. St. Hyacinthe, 12 in.; Glastonbury, 4 in.; Montreal, 5 in.

4. Pelee Island, 9 in.; Ottawa, 4 in.

5. Buda, 4 in.; Father Point, 6 in.; Alexandria, 4 in.

6. Turtle Mountain, 8 in.; Hillview, 10 in.; Elkhorn, 7 in.; Pilot Mound, 5 in.; Glen Adelaide, 8 in.; Minnedosa, 6 in.

7. Buda, 4 in.

9. Peterboro', 5 in.; Welland, 4 in.; Cowal, 4 in.; Ennismore, 4 in.; St. Thomas, 5 in.; St. Mary's, 4 in.; Lindsay, 8 in.

10. Bancroft, 4 in.; Alton, 8 in.; St. Hyacinthe, 8 in.; Egremont, 4 in.; Cape Magdalene, 6 in.; Sharon, 7 in.; Clontarf, 5 in.; Oonikup, 4 in.; Brantford, 5 in.; Stoney Creek, 5 in.; Fergus, 6 in.; Barrie, 6 in.; Denbigh, 5 in.; Coldstream, 6 in.; Orangeville, 11 in.; Cayuga, 4 in.; Aurora, 6 in.; Georgetown, 6 in.; Collingwood, 4 in.; Lakefield, 6 in.; St. Andrew's, 4 in.; Fredericton, 4 in.; Coldwater, 4 in.; Ottawa, 4 in.; Toronto, 4 in.; Montreal, 7 in.; Durham, 4 in.; Alexandria, 4 in.

13. Savanne, 4 in.

16. De Cewsville, 4 in.
 17. Griffin Lake, 5 in.
 18. Spence's Bridge, 4 in. ; Brandon, 4 in.
 19. Burk's Falls, 4 in. ; Presqu'Isle, 12 in. ; Wiarton, 13 in. ; Calgary, 12 in. ; Spence's Bridge, 9 in. ; Nicola Lake, 6 in. ; Donald, 18 in. ; Novar, 5 in. ; Bognor, 5 in. ; Sprucedale, 6 in. ; Owen Sound, 6 in. ; Banff, 21 in. ; Glenbow, 6 in.
 20. Bognor, 4 in. ; Owen Sound, 7 in. ; Welland, 6 in. ; Sunshine, 6 in.
 21. Sault St. Marie, 6 in. ; Cartier, 6 in. ; Fort Francis, 9 in. ; Thompson, 8 in.
 22. Donald, 9 in. ; Point Clark, 6 in. ; Dalhousie, 4 in. ; Barrie, 5 in. ; Durham, 6 in.
 23. Bicquet, 4 in. ; Lucknow, 5 in. ; Mount Forest, 4 in. ; Coldstream, 6 in. ; Sunshine, 4 in. ; St. Thomas, 5 in. ; Collingwood, 6 in. ; Saugeen, 5 in. ; Edmonton, 6 in. ; Father Point, 5 in.
 24. Griffin Lake, 5 in. ; Fort Ellice, 4 in. ; Hillview, 4 in. ; Saskatoon, 10 in. ; Henrietta, 23 in. ; Wilton Grove, 9 in. ; Coldstream, 10 in. ; Glastonbury, 4 in. ; Thedford, 5 in. ; Swift Current, 10 in. ; Bathurst, 6 in.
 25. Brandon, 7 in. ; Turtle Mountain, 7 in. ; Posen, 9 in. ; Hillview, 4 in. ; Oak Bank, 4 in. ; Elkhorn, 7 in. ; Oonikup, 6 in. ; Rathwell, 9 in. ; Minnedosa, 12 in. ; Winnipeg, 5 in.
 26. Pilot Mound, 6 in. ; Brandon, 6 in.
 27. Griffin Lake, 9 in. ; Shannonville, 4 in. ; Birnam, 12 in. ; Cowal, 5 in. ; Sarnia, 8 in.
 28. Norwood, 9 in. ; Sombra, 7 in. ; Ridgetown, 4 in. ; Coldstream, 6 in. ; Belleville, 4 in. ; St. Thomas, 5 in. ; Thedford, 7 in. ; Wyoming, 7 in. ; St. Mary's, 4 in. ; Port Stanley, 4 in. ; Kingston, 5 in.
 29. London, 7 in.
- Thunder recorded on*
14. Shannonville.
 15. Shannonville.
 16. Lucknow.
 17. Uplands, Peterboro' Haliburton, Cottam, Point Clark, Novar.
 18. Peterboro' Bancroft.
 24. Uplands.
- Aurora recorded—*
- The class of aurora, if noted by observer, is given, (I), being the brightest, (IV), the feeblest in brilliancy.*
4. London, IV.
 7. Minnedosa, III.
 8. Little Forks, IV.
 9. Father Point IV.
 13. Hillview,
 14. Chicoutimi, IV ; Truro, IV.
 16. Gravenhurst, IV ; Elkhorn, II ; Savanne, Hillview.
 17. Dorchester, N.B., II ; Richmond, IV ; Quebec, IV ; Fredericton, IV ; Alexandria, IV.
 18. Saskatoon, IV ; Hillview.
 21. Henrietta III ; Hillview.
 26. Elkhorn, II.
 27. Little Forks, III.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE
THE HORIZON IN THE MONTH OF NOVEMBER, 1892.

HOURS ENDING																	
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.	
ESQUIMALT.....	0 00	0 07	0 16	0 20	0 22	0 20	0 23	0 14	0 04	0 00	..	..	..
AGASSIZ, B.C.....	00	00	01	01	04	02	02	02	00	00	..	..	..
BRANDON.....	00	02	05	14	23	31	29	27	18	00	..	..	..
INDIAN HEAD.....	01	03	12	28	30	30	28	25	15	01	..	..	..
WINNIPEG.....	01	16	23	30	35	43	44	33	22	00	..	..	..
WOODSTOCK.....	01	13	14	20	22	14	11	07	06	02	..	..	..
TORONTO.....	02	12	17	20	32	29	18	10	13	02	..	..	..
LINDSAY.....	00	02	04	11	17	16	12	14	08	01	..	..	..
BARRIE.....	00	03	12	18	16	17	16	10	09	02	..	..	..
KINSTON.....	06	19	19	21	18	19	13	12	06	00	..	..	..
MONTREAL.....	11	19	21	10	13	12	15	15	03	00	..	..	..
FREDERICTON.....	01	06	12	12	22	17	20	21	22	09	..	..	..
SYDNEY.....	02	12	19	25	22	18	25	19	16	04	..	..	..

	ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)	0 13	0 02	0 16	0 19	0 27	0 12	0 16	0 09	0 11	0 14	0 15	0 15	0 17
MAXIMUM DAILY AMOUNT.....	0 80	0 20	0 81	0 87	0 87	0 64	0 70	0 52	0 55	0 86	0 98	0 90	0 63
DATE.....	5	19	15	15	15	23	22	22	6	20	11	21	24
NO. OF DAYS COMPLETELY CLOUDED.....	17	23	16	15	11	19	12	16	13	14	13	14	12

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 618. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
MANITOBA.....	92	59	19	14	74 5
LOWER LAKE REGION.....	108	91	9	8	88 4
UPPER ST. LAWRENCE.....	107	82	15	10	83 6
LOWER ST. LAWRENCE.....	105	73	18	14	78 1
GULF.....	104	70	18	16	76 0
MARITIME PROVINCES.....	102	80	13	9	84 8
TOTAL.....	618	455	92	71	81 1

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions, the reports from the agents at the "Probability" stations, as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer B. C. Webber.

STORM WARNINGS.

During the month warnings on the approach of ten storms were issued to our agents and cautionary signals duly displayed at the various signal stations. The total number of warnings issued was 307, of which 266 or 86·6 per cent. were verified. At nineteen stations, however, the force exceeded, and at 16 did not reach that indicated by the signals displayed; five stations reported warnings received late owing to delay in issue, and eighteen stations owing to delay in transmission.

In connection with the warnings, predictions as to the probable directions of the wind were given, and of the 266 warnings verified as to force, 240 or 90·2 per cent. were fully verified, and 265 or 99·7 per cent. were fully and partially verified as to direction.

1. At 10 a.m. on the 3rd, owing to a developing storm centre north-west of the Lakes and a developing high area north of Manitoba, signals indicating a moderate north to north-east gale were ordered for Lake Superior and the Georgian Bay. Next morning at 10 a.m. the warning was extended to the other Lakes, No. 2 for a moderate gale being hoisted. At Port Arthur no storm occurred; at Sault Ste. Marie a moderate gale began at 2 a.m. and reached its height at 4.30 p.m., blowing from the east. On the Georgian Bay and Lake Huron a fresh to strong gale began during the night or early next day, blowing from the north, and on the other Lakes during the afternoon, blowing a moderate to fresh gale from the north and north-west. Presque Isle reports 7 p. m. to 8 p.m. 4th N.W. 45; Owen Sound 4th 6 p.m. N. heavy gale; Port Dalhousie 6 p.m. to midnight N. 50. Signals were lowered during the forenoon of 5th.

2. At 11.27 4th, when the above mentioned storm centre was in Northern Ontario, signal No. 2 indicating a moderate north to east gale was ordered for the Lower St. Lawrence and Bay of Chaleur, and on the following morning, with the centre near the Coast of Maine, the same signal for a north-east to north-west gale was ordered for the Gulf of St. Lawrence and Maritime Provinces. At some of the points warned there was a moderate gale during the evening of the 5th, or early morning of the 6th, but generally the wind did not exceed a fresh to strong breeze; Father Point reports 5th 9 a.m. N.E. 39; Ingonish 5th midnight N.E. fresh gale.

3. At 9.45 p.m. 5th, owing to a developing storm centre over the North-west Territories, signal No. 3, indicating a heavy gale at first from an easterly direction, was ordered for Lake Superior. The storm continued to develop and moved eastward until at 8 p.m. on the 6th the centre was near Duluth. At 10.15 p.m. 6th, signal No. 4 was ordered for Lakes Superior, Erie and Ontario, and No. 3 for the Georgian Bay and Lake Huron; an easterly gale prevailed on Superior on the 6th, and afterwards as the storm moved directly across the Lake Region, a heavy south-westerly to westerly gale prevailed on the other Lakes during the 7th, more especially at night. Sault Ste. Marie reports 7th 8.30 p.m. W. heavy gale; Presque Isle 7th 11 p.m. to midnight S.W. 50; Goderich 7th 10 p.m. to midnight S.W. about 60; Port Dalhousie midnight S.W. 45; Deseronto 8th 6 a.m. W. 60.

4. At 10.20 p.m., when the storm centre was near Sault Ste. Marie, signal No. 4 for a heavy south shifting to north-west gale was ordered for stations on the Bay of Chaleur, and No. 2 for a moderate south to west gale was ordered for other stations in the Gulf of St. Lawrence and Maritime Provinces. As the storm dispersed as it moved eastward the gale was not severe in Eastern Canada, but a moderate to fresh south-westerly gale prevailed during the 8th at most of the points warned. Signals were lowered that evening.

5. On the night of the 9th there was a developing depression moving northeastward across the Southern States, and at 10.10 p. m. Signal No. 3 was ordered for Sault St. Marie and for Lakes Erie and Ontario, and No. 4 for the Georgian Bay and Lake Huron, the gale expected to be from the east, veering to northwest. There was no blow at the Sault, but a moderate northeast to north-west gale prevailed early on the 10th at most of the other stations warned.

6. At the same time that Lake Stations were warned on the evening of the 9th, Signal No. 3 indicating a heavy gale, at first from an easterly direction, was ordered for stations in the Gulf and Maritime Provinces. The storm centre moved directly northeastward across the Bay of Fundy and a fresh to heavy easterly to southerly gale blew very generally in the districts warned during the afternoon and evening of the 10th. Signals were lowered during the forenoon of the 11th.

7. During the evening of the 12th there was a developing depression moving eastward across Manitoba, and at 10 p. m. Signal No. 2 for a moderate south veering to northwest gale was ordered for Lake Superior. At 10.10 a. m. next morning Signal No. 3 was ordered for the Georgian Bay and Lake Huron, and No. 2 for Lakes Erie and Ontario. The storm centre moved eastward across Northern Ontario with diminishing energy; a fresh northwesterly gale prevailed on the lower

portion of Lake Superior early on the 13th, and moderate to fresh southerly to southwesterly gales prevailed on the other lakes during that night and early next day. Midland, 13th, 10 p. m., S. heavy gale; Presqu'Isle, 13th, 5 to 6 p. m., S. W. 35; Port Dalhousie, 14th, 4 a. m. to sunrise, S. W. 30; Kingston, during night and early morning, S. 35-40. Signals were lowered during forenoon of 14th.

8. At 10.10 a. m. 17th in advance of a severe storm moving northeast from the Mississippi Valley, Signal No. 3 for a heavy northeast shifting to northwest gale, was hoisted on Lake Superior and No. 3 was hoisted on Erie and Ontario and No. 4 on the Georgian Bay and Lake Huron for an easterly storm. An easterly gale with rain began that same afternoon at almost all points warned. At 4.10 p. m. Signals were changed, No. 4 being ordered for Erie and Ontario and No. 3 for the Georgian Bay and Lake Huron for a south veering northwest gale. The storm reached its height in most instances during the early morning, blowing a fresh to heavy gale from the southwest, except on Superior, where an easterly was followed by a northwest gale. Safety messages were despatched at 9 a. m. 19th.

9. When on morning of 18th the storm centre above mentioned was near the Sault St. Marie Signal No. 1 for a moderate east veering to south and southwest gale was ordered for all ports in Eastern Canada. A moderate to fresh southeasterly gale, with very heavy rain, prevailed during the 19th at almost all points warned, as the storm centre with diminishing energy approached the Gulf of St. Lawrence. Signals were ordered down at 10.30 on 19th.

10. During the 29th there was a developing storm off the Middle Atlantic coast, and at 10.20 p. m. Signal No. 3 for an easterly gale was ordered for the Maritime Provinces and the lower part of the Gulf of St. Lawrence. The gale began in the Bay of Fundy early on the 30th, and further east later in the day, and at most points the wind reached its maximum force during the early hours of the 1st. The warning was extended to the Bay of Chaleur and northern part of the Gulf at 4.20 p. m. of the 30th, but in these districts was not so severe as further south. Heavy easterly gales were reported from Digby, N. S., Liverpool, N. S., Port Hood, N. S., and Port Hastings, N. S. The storm centre slowly dispersed to the southward of Nova Scotia. Signals were lowered during the forenoon of the 1st December.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR NOVEMBER, 1892.

The magnets during the first two days remained very quiet. A small disturbance was recorded on the morning and night of the 3rd. Between 6 and 8 a. m. of the 4th the magnets were oscillating very much, and during the evening a moderate storm was registered. The declination magnet arrived at its easterly extreme after 8 p. m., after which it slowly regained its normal position, but remained slightly disturbed up to the morning of the 5th. Both forces were changing rapidly during this disturbance especially the h. f., there was, however, no large departure from the normal. The h. f. magnet would occasionally take a rapid swing, followed by oscillations. The v. f. during the early portion of the disturbance was above its normal value. On the 5th the magnets steadied down and remained comparatively quiet until the evening of the 14th, when a little irregularity was recorded lasting a short time. On the morning of the 15th the curves became slightly abnormal and on the 11th and 18th, slow waves of disturbance were registered. From the 19th to the end of the month slight disturbances would occasionally appear. In fact a marked feature in the month's curves was the absence of any important disturbance.

On the 12th appearance of aurora 10.30 to 11.30 p. m. On the 3rd, 4th, 7th, 8th, 10th, 16th, 19th, 22nd and 23rd, the sky was clear. On all other nights, clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL

Director.

METEOROLOGICAL OFFICE,

Toronto, January 4th, 1893.

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

DECEMBER, 1892.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraph reports of observations received at this office for the purpose of weather predictions, and the reports of storms received by mail. For the material used in tracing the courses of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

ATMOSPHERIC PRESSURE.

The average pressure, as determined from the observations taken at telegraphic reporting stations, was slightly above the normal of eighteen years in the eastern portion of Ontario and at all stations further east, but above the normal at all western stations.

There were few marked weather changes during the month, a cyclone of some importance developed to the southwest of the lakes, causing a moderate gale in the lake district on the 7th and 8th, and on the 11th an anti-cyclone developed over the Middle States and spread over the greater part of the continent.

A dispersing cyclone covered the eastern provinces at the commencement of the month whilst general anti-cyclonic conditions prevailed over the lakes. In the Maritime Provinces the weather was unsettled with occasional local rainfalls. Low pressure gradually extended eastward, over the lake region during the 2nd and a depression which had passed over the Northwest Territories on the 1st, giving light local snowfalls, moved into the lake district on the 2nd where cyclonic conditions with westerly winds and light local falls of snow or sleet were general till the 4th, when there was an easterly movement, and on the 5th fine anti-cyclonic weather covered the lakes and extended to Eastern Canada.

On the 6th a trough of low pressure stretched from the Hudson's Bay to Texas, and by the 7th an important cyclone had developed over the Middle Mississippi Valley. By night it was central near Chicago, and strong easterly winds with rain or sleet were general throughout the lake district. With decreasing energy the cyclone then moved eastward to New Brunswick. Rain or sleet extended throughout Quebec and the Maritime Provinces during the 8th, and next day it cleared up in Eastern Canada. The cyclone moving north-east over the Gulf of St. Lawrence, but a subsidiary cyclone slowly formed over the lakes, keeping the weather unsettled there with light local falls of sleet or rain until the 11th. It also caused a light fall of snow in Quebec and the Maritime Provinces on the 11th.

In the North-west a light fall of snow on the 1st, was followed by anti-cyclonic conditions and fine cold weather.

This was interrupted on the 3rd over Assiniboia and Alberta by the passage south-east of a cyclone from the Pacific Ocean which caused a rise in temperature over the Territories and light local falls of snow.

Higher pressure again prevailed on the 5th with fine cold weather. On the 7th and 8th, steep gradients gave strong north and west winds; the weather kept fine and it was comparatively mild in Alberta, but continued cold eastward.

An important anti-cyclone developed over the Middle States on the 10th, and soon expanded over the greater part of the continent. Generally fair weather prevailed everywhere until the night of the 13th, by which time the anti-cyclone had moved off the Atlantic coast and a cyclone which first appeared over Texas on the 12th had travelled to the lakes over which it passed on the 14th, giving a general fall of rain throughout Ontario. It moved to Northern Ontario, and then expanded with diminished energy over Eastern Canada, where light local falls of snow or rain occurred on the 15th and 16th, it then travelled eastward across the Gulf of St. Lawrence when fair colder weather and anti-cyclonic conditions followed.

On the 18th a cyclone was central over Lake Superior which had moved south-east from the North-west Territories. Thence it took an easterly course giving a moderate fall of snow over Ontario, on the 18th and through Eastern Canada the next day, passing over the Gulf of St. Lawrence on the 20th.

In the North-west, owing to a slight decrease in pressure on the 11th, caused by a cyclone to the north, local snow falls and a rise in temperature occurred. Cyclonic conditions became more pronounced next day and on the 13th, when high westerly winds generally prevailed in Alberta and Assiniboia extending at night of the latter day to Manitoba, accompanied in many places by a moderate fall of snow. A slight increase in pressure on the 14th, and a fall of temperature to -16° followed over Manitoba.

Until the 19th slight pressure or temperature changes occurred ; generally fine weather being the rule with occasional light local snow-falls. On this day the conditions became more of a pronounced anti-cyclonic nature and the weather decidedly fine and cold every where. The maximum pressure was attained on the 21st, when over Alberta and Assiniboia the barometric readings were generally above 31.00 in. reduced to M.S.L., with temperature falling to between -26° to -36° throughout the North-west.

In Eastern Canada on the 20th a cyclone which had moved up the Atlantic coast, passed off the Nova Scotian coast, giving a fall of snow in that province. A slight low pressure trough extended from this back to the lakes which caused some snow in Western Ontario during the 21st and 22nd. From then until the 27th low pressure continued throughout Eastern Canada, backing west to the lakes. Generally fair and decidedly cold weather, with fresh and at times high westerly winds and occasionally light local falls of snow, were the rule, the west of the lakes being covered by a determined anti-cyclone.

During the 27th the anti-cyclone spread eastward over the Lakes and Eastern Canada accompanied by fine cold weather, which continued till the end of the month.

Light local falls of snow occurred in Assiniboia and Alberta on the 23rd, 24th, 25th and 26th, otherwise the weather was decidedly fine and cold in these districts until the 29th when the weather moderated and it continued mild till the end of the month.

In Manitoba, continued fine, decidedly cold weather was the rule until the 31st, when a general decrease in pressure took place accompanied by higher temperature.

TEMPERATURE.

The average temperature, as determined from the observations taken at telegraph reporting stations, was above the normal of eighteen years, except near the Gaspé Peninsula. The greatest defect was in the North-west Territories where it amounted to a little over 7° .

The highest and lowest Temperatures in each Province during December were:

British Columbia, $59^{\circ}0$ on 24th at Quamichan ; $-38^{\circ}0$ on 22nd at Donald.

North-west Territories, $41^{\circ}2$ on 31st at Medicine Hat ; $-47^{\circ}0$ on 22nd at Saskatoon.

Manitoba, $32^{\circ}0$ on 2nd at Oak Bank ; $-42^{\circ}0$ on 22nd at Fort Ellice.

Ontario, $55^{\circ}0$ on 6th at Point Pelee ; $-50^{\circ}5$ on 23rd at White River.

Quebec, $52^{\circ}0$ on 24th at Exquimaux Point ; $-23^{\circ}2$ on 26th at Chicoutimi.

New Brunswick, $49^{\circ}0$ on 9th at St. John ; $-15^{\circ}0$ on 23rd at Dorchester.

Nova Scotia, $62^{\circ}2$ on 18th at Pictou ; $-17^{\circ}7$ on 24th at Truro.

Prince Edward Island, $48^{\circ}8$ on 1st at Charlottetown ; $-6^{\circ}6$ on 23rd at Kilmahumaig.

ERRATA in October Review at ALEXANDRIA.—Highest temperature, $68^{\circ}1$ on 14th ; lowest, $23^{\circ}4$ on 12th. Mean daily range, $15^{\circ}1$; greatest, $37^{\circ}2$. Amount of cloud 7 ; days clouded 9. Winds N. 6, N.E. 2, E. 7, S.E. 4, S. 2, S.W. 11, W. 35, N.W. 23, C. 4. Daily velocity II ; highest IV, 6th W. Rain, 2.16 ; difference from average -0.68 . No. of days 14. No. of auroras 5.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, DECEMBER, 1892.

	PRESSURE IN INCHES.			TEMPERATURE OF AIR.					TEMPERATURE OF					DIRECTION OF WIND FROM.					VELOCITY OF WIND.					PRECIPITATION.												
	Mean actual.	Mean reduced.	Range.	Mean.	Diff. from aver. age.	Years observ.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Greatest daily range.	Mean temperature of dewpoint.	Mean relative humidity.	Mean amount of cloud.	No. of days completely clouded.	DIRECTION OF WIND FROM.					Total number of hours.	Mean, miles per hour.	Highest days.	Date and direc- tion.	Amount.	Diff. from aver. age.	in.	No. of fair days.	No. of Auroras.	No. of Thunderstorms.	No. of Fogs.				
																	N.	E.	S.	S.W.	W.												N.W.	C.		
N.W. TERRITORIES.																																				
Medicine Hat.....	30.20	30.87	29.62	1.25	10.8	0.7	9.41-2	31	-28.0	22	19.748-9	22	18.137-0	7	11	3	1	4	1	8	9	20	8	62	25.5	30 S	1.42	+1.06	21	10	5	0	0			
Edmonton.....	30.14	30.99	29.54	1.45	9.1	2.2	9.40-0	14	-40.0	22	18.137-0	22	18.137-0	6	3	0	1	0	3	4	3	12	38	62	17.3	13NW	0.82	+0.41	9.22	0	0	0	0			
Prince Albert.....	30.16	30.82	29.56	1.26	3.8	4.8	6.34-8	31	-11.5	22	21.843-1	22	21.843-1	6	8	2	1	0	0	3	5	47	62	17.3	13NW	0.30	+0.19	9.22	0	0	0	0				
Battleford.....	30.24	31.11	29.70	1.41	7.3	—	34.0-1	17-31	-41.0	22	19.243-0	22	19.243-0	6	7	1	1	1	5	0	3	14	9	28	62	11.20	0	0	0	0	0	0				
Swift Current.....	30.24	31.11	29.70	1.41	7.7	7.7	7.32-0	15-31	-32.8	22	14.531-8	22	14.531-8	6	8	2	1	1	5	0	4	12	19	13	62	11.20	0	0	0	0	0	0				
Qu'Appelle.....	30.18	30.95	29.72	1.23	0.4	7.2	9.27-5	17	-40.4	22	19.634-2	22	19.634-2	6	5	3	1	1	6	15	8	14	9	62	11.20	0	0	0	0	0	0	0				
Saskatoon.....	28.10	28.55	27.73	0.82	1.0	—	28.5	31	-47.6	22	18.144-0	22	18.144-0	5	7	6	3	0	1	3	5	9	4	31	17.0	14NW	0.28	-0.40	8.23	0	0	2	0			
Wallace.....	30.20	30.80	29.64	1.16	12.0	4.5	8.40-2	31	-33.7	22	19.850-9	22	19.850-9	5	2	7	2	1	2	0	0	4	11	35	62	26.7	20 N	0.09	-0.68	8.23	0	0	0	0		
Regina.....	30.20	30.80	29.64	1.16	0.0	11.5	9.35-0	15	-22.0	21	19.911-2	21	19.911-2	5	2	6	7	1	0	0	0	18	6	3	93	11	31W	0.90	—	7.24	5	0	0	0		
•Chaplin.....	30.20	30.80	29.64	1.16	-1.1	—	31.9	31	-45.4	22	21.634-9	22	21.634-9	5	2	6	7	1	0	3	12	32	13	19	93	11	31W	0.45	—	3.28	0	0	0	0		
Henrietta.....	30.20	30.80	29.64	1.16	12.6	9.2	3.38-8	30	-42.5	22	21.634-9	22	21.634-9	5	2	6	7	1	0	3	12	32	13	19	93	11	31W	0.45	—	3.28	0	0	0	0		
Bank.....	30.20	30.80	29.64	1.16	2.2	15.9	2.32-0	30	-47.0	23	19.838-0	23	19.838-0	5	2	6	7	1	0	3	12	32	13	19	93	11	31W	0.45	—	3.28	0	0	0	0		
Codman.....	30.20	30.80	29.64	1.16	2.2	15.9	2.32-0	30	-47.0	23	19.838-0	23	19.838-0	5	2	6	7	1	0	3	12	32	13	19	93	11	31W	0.45	—	3.28	0	0	0	0		
Glen Adelaide.....	30.20	30.80	29.64	1.16	2.2	15.9	2.32-0	30	-47.0	23	19.838-0	23	19.838-0	5	2	6	7	1	0	3	12	32	13	19	93	11	31W	0.45	—	3.28	0	0	0	0		
MANITOBA:																																				
Minnetonka.....	30.13	30.73	29.52	1.21	-1.9	—	7.3-9	27-0	17	-36.1	25	20.939-3	25	20.939-3	5	2	2	1	3	0	0	6	21	16	25	62	17.0	14W	0.15	-0.58	8.23	4	0	0	0	
Winnipeg.....	30.16	30.70	29.55	1.15	-1.9	—	6.218-3	0	2	-36.8	25	20.939-3	25	20.939-3	5	1	10	1	2	0	12	13	19	11	4	62	26.0	18N	0.10	-0.98	10.21	1	0	0	0	
Dauphin.....	30.16	30.70	29.55	1.15	-1.4	—	9.1-7	25-0	17	-35.0	22	21.740-5	22	21.740-5	5	2	6	7	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0
Hillview.....	30.16	30.70	29.55	1.15	-3.8	—	37-3	25	-19.6	22	19.538-0	22	19.538-0	5	2	6	7	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0	
Elkhorn.....	30.16	30.70	29.55	1.15	0.4	5.2	3.30-0	1	-33.0	25	19.632-0	25	19.632-0	5	2	6	7	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0	
Portage La Prairie.....	30.16	30.70	29.55	1.15	-1.6	—	8.5-1	29-5	13	-34.5	23	19.538-0	23	19.538-0	5	2	6	7	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0
St. Albans.....	30.16	30.70	29.55	1.15	-0.7	—	6.7-6	30-0	1	-35.0	25	19.538-0	25	19.538-0	5	2	6	7	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0
•Fort Osborne.....	30.16	30.70	29.55	1.15	-1.7	—	12.5-2	23-0	2	-41.6	23	21.848-0	23	21.848-0	5	4	1	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0	
Oak Bank.....	30.16	30.70	29.55	1.15	-2.6	—	11.2-3	28-0	17	-42.0	22	17.633-0	22	17.633-0	5	4	1	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0	
Fort Ellice.....	30.16	30.70	29.55	1.15	-2.2	—	13.0-2	25-0	4-17	-37.0	22	17.633-0	22	17.633-0	5	4	1	1	0	3	11	15	23	25	14	93	11	31W	0.45	—	3.28	0	0	0	0	
Posen.....	30.16	30.70	29.55	1.15	-2.6	—	8.1-4	29-4	13	-37.0	23	26.746-1	23	26.746-1	5	1	3	14	2	0	2	18	24	26	4	93	11	31W	0.45	—	3.28	0	0	0	0	
Brandon.....	30.16	30.70	29.55	1.15	-2.6	—	8.1-4	29-4	13	-37.0	23	26.746-1	23	26.746-1	5	1	3	14	2	0	2	18	24	26	4	93	11	31W	0.45	—	3.28	0	0	0	0	
Channel Island.....	30.16	30.70	29.55	1.15	-5.5	—	9.1-6	28-0	13	-34.0	24	17.137-0	24	17.137-0	5	4	7	1	6	6	23	4	15	31	0	93	11	31W	0.45	—	3.28	0	0	0	0	
ONTARIO:																																				
•Buda.....	30.16	30.70	29.55	1.15	0.3	-14.3	5.35-0	2	-44.0	23	23.745-0	23	23.745-0	5	2	6	7	1	0	6	6	6	30	44	93	11	31W	0.45	—	3.28	0	0	0	0		
Savanne.....	30.16	30.70	29.55	1.15	1.5	-6.8	7.39-0	17	-44.0	23	18.539-0	23	18.539-0	5	2	6	7	1	0	6	6	6	30	44	93	11	31W	0.45	—	3.28	0	0	0	0		
Biscostasing.....	30.16	30.70	29.55	1.15	1.4	-14.2	3.28-0	20	-35.0	23	—	—	—	5	2	6	7	1	0	6	6	6	30	44	93	11	31W	0.45	—	3.28	0	0	0	0		
Chapman.....	30.16	30.70	29.55	1.15	8.1	0.3	3.45-0	5	-30.0	21	—	—	—	5	2	6	7	1	0	6	6	6	30	44	93	11	31W	0.45	—	3.28	0	0	0	0		
•Heron Bay.....	30.16	30.70	29.55	1.15	1.9	-8.1	6.30-0	1	-35.0	25	—	—	—	5	2	6	7	1	0	6	6	6	30	44	93	11	31W	0.45	—	3.28	0	0	0	0		
•Nepigon.....	30.16	30.70	29.55	1.15	12.2	2.2	6.33-0	2	-20.0	23	—	—	—	5	2	6	7	1	0	6	6	6	30	44	93	11	31W	0.45	—	3.28	0	0	0	0		
•Carter.....	30.16	30.70	29.55	1.15	1.6	-2.5	5.34-2	1	-50.5	23	23.646-0	23	23.646-0	5	6	5	0	0	1	8	1	8	5	34	62	11	31W	0.45	—	3.28	0	0	0	0		
White River.....	30.16	30.70	29.55	1.15	5.3	-8.6	2.32-0	2	-42.0	25	—	—	—	5	2	6	7	1	0	6	6	6	30	44	93	11	31W	0.45	—	3.28</						

ONTARIO—Concluded.

[illegible]

STATIONS RECEIVED TOO LATE FOR THE NOVEMBER REVIEW.

PROVINCE.	STATION.	MEAN	HIGHEST		LOWEST		PRECIPITATION.		AURORA.	REMARKS
		TEMP.	Temp.	Date.	Temp.	Date.	Amount.	Days.		
		°	°		°		in.			
British Columbia	Kermooes.....	36.52	55.0	4	13.0	25	2.60	10		Heaviest rainfall for month ever remembered in district.
N. W. Territories	Regina.....	16.93	50.0	4	-21.0	27	0.32	8		
Manitoba	St. Albans.....	16.14	46.0	2	-21.0	22	0.81	13	8th III	
	Channel Island.....	15.40	40.0	5	-13.0	22	1.85	7	16 IV, 18 IV, 24 IV	9th Lake froze over.
	Portage la Prairie	22.09	42.0	2	-18.0	22	2.12	12		Brilliant meteor on 21st at 9.30 p.m.
Ontario	Little Current.....	31.52	51.0	7	5.0	23	3.590	13	8 IV, 14 IV, 30 IV.	First snow on 21st.
	Georgina.....	36.80	62.8	23	13.5	29	0.98	14		
Quebec	Lennoxville	33.80	65.0	18	14.2	6	2.62	18	18 IV	

PRECIPITATION.

The rainfall has in general fallen far below the average for December in Quebec, New Brunswick and P. E. Island, where it was slightly above the normal, it was more than compensated by the (in common with the rest of the Dominion) very light snowfall.

The general distribution is as follows :—

In British Columbia the rainfall on the coast was 6.17 in., or about the average—in the interior little or no rain has fallen.

In the North-West Territories rain only fell at two or three stations.

In Manitoba the rainfall was confined to a slight fall at a few places on the first of the month.

In Ontario, West and South-West District it was 0.93 in., or 0.54 in. below the average. In the North and North-West District it was 0.49 in., or 0.31 in. below the average. In the Central District it was 0.87 in.; or 0.17 in. below the average; and in the East and North-East District it was 0.42 in.; or 0.36 in. below the average.

In Quebec it was 0.84 in., or 0.11 in. above the average.

In New Brunswick it was 1.99 in., or 0.41 in. above the average.

In Nova Scotia it was 1.82 in., or 1.75 below the average.

In Prince Edward Island it was 1.85 in., or 0.10 in. above the average.

Rainfall 5 in. and upwards during month :—

British Columbia—Loch Erroch, 8.01 in.; Fort Simpson, 11.01 in.

Abbotsford, 6.18 in.; Agassiz, 5.04 in.

St. John, Nfld., 5.50.

Rainfall 1 inch and upwards in 24 hours :—

1. Kilmahumalg, 1.52 in.; Channel, 1.00 in.; Chatham, 1.20 in.

2. Point des Monts, 1.20 in.

3. Point des Monts, 1.50 in.

6. Lyons, 1.18 in.

7. Lion's Head, 1.00 in.

8. Wiarton, 1.10 in.; Fort Simpson, 1.63 in.

9. Point Lepreaux, 1.75 in.; Digby, 1.00 in.; Port Hastings, 2.25 in.; Channel, 1.23 in.; Halifax, 1.75 in.; Yarmouth, 2.05 in.; Truro, 1.04 in.; Grand Manan, 1.23 in.

10. Quamichan, 1.20 in.

11. Forth Simpson, 1.15 in.

12. St. Johns, Nfld., 1.50 in.

13. Fort Simpson, 1.07 in.

24. Abbotsford, B.C., 1.15 in.

27. Quamichan, 2.10 in.

30. Agassiz, 1.08 in.; Esquimalt, 1.25 in.

31. Fort Simpson, 1.62 in.

SNOWFALL.

The average snowfall for the month has throughout the Dominion been considerably below the average quantity although at some stations in various districts exceptionally heavy falls have occurred. The distribution is as follows :

BRITISH COLUMBIA. Snow has fallen to a limited extent on the coast and in Vancouver Island, but in the interior of the province falls of from three to five feet are recorded.

In the N. W. TERRITORIES 6 in. has fallen, a little short of December, 1891.

IN MANITOBA 2.8 in. has fallen, or about one-third less than the average.

In the DISTRICTS OF ONTARIO the amount is 8.0 in. or 7.2 in. below the average ; 20.5 in. or 4.4 in. below the average 4.0 in. or 10.7 in. below the average ad 14.1 in. or 4.7 in. below the average.

In QUEBEC 16.8 in. or 4.6 in. below the average.

In N. BRUNSWICK 5.7 in. or 13.5 in. below the average.

In NOVA SCOTIA 9.3 in. or 10.9 in. below the average.

In P. E. ISLAND 5.2 in. or 14.8 in. below the average.

Monthly Snowfall 12 in. and upwards.

BRITISH COLUMBIA. Spence's Bridge, 15 in.; Barkerville, 42 in.; Nicola Lake, 16 in.; Donald, 30 in.; Griffin Lake, 24 in.; Chilcotin, 57 in.

N. W. TERRITORIES and MANITOBA.—Medicine Hat, 12 in.; Swift Current, 30 in.

ONTARIO.—Kingston, 22 in.; Saugeen, 40 in.; Durham, 36 in.; Coldwater, 31 in.; Deseronto, 12 in.; Alexandria, 17 in.; Ottawa, 17 in.; Bognor, 33 in.; Midland, 31 in.; Thedford, 19 in.; Wiarton, 33 in.; Coldstream, 25 in.; Presque Isle, 33 in.; Denbigh, 13 in.; Mount Forest, 16 in.; Barrie, 22 in.; Sunshine, 23 in.; Calvin, 29 in.; Burk's Falls, 30 in.; Goderich, 17 in.; North Bruce 13 in.; Heron Bay, 13 in.; Egremont 14 in.; Uplands, 26 in.; Whiteside, 30 in.; Sprucedale, 33 in.; Owen Sound, 36 in.; Orillia, 24 in.; Novar, 23 in.; Lucknow, 33 in.; Mattawa, 24 in.; Gravenhurst, 28 in.; Birnam, 20 in.; Clontarf, 12 in.; Point Clark, 16 in.; Beatrice, 27 in.; Sault St. Marie, 69 in.; Bancroft, 13 in.; Buda, 12 in.; Parry Sound, 39 in.

QUEBEC.—Father Point, 17 in.; St. Hyacinthe, 21 in.; Chicoutimi, 12 in.; Richmond, 17 in.; Cape Magdalene, 26 in.; Point des Monts, 20 in.

N. BRUNSWICK.—Dalhousie, 17 in.

NOVA SCOTIA.—Sydney, 12 in.; Yarmouth, 19 in.; Truro, 16 in.; Digby, 17 in.

NEWFOUNDLAND.—St. John, 37 in.; Channel, 13 in.

Snowfall one inch and upwards in 24 hours:—

1. St. Hyacinthe, 4 in.; Point des Monts, 6 in.; Griffin Lake, 5 in.; Father Point, 7 in.; Swift Current, 5 in.

2. Chicoutimi, 6 in.

3. Burks Falls, 4 in.; Cartier, 6 in.

4. Point Escuminac, 4 in.

5. Glastonbury, 4 in.

6. Denbigh, 4 in.; Calvin, 4 in.; Burks Falls, 4 in.; Gretna, 7 in.; Southwood, 8 in.; Missanabic, 6 in.; Mattawa, 5 in.; Rockliffe, 4 in.; Sprucedale, 4 in.

7. Cartier 4 in.; Point des Monts, 4 in.; Bathurst, 6 in.

8. Dalhousie N. B., 6 in.; Georgina, 7 in.

9. Chilcotin B. C., 11 in.

10. Midland 4 in.; St. Johns, Nfld., 5 in.

11. Wiarton, 4 in.; Barrie, 5 in.; Barkerville, 8 in.; Coldwater, 6 in.; Bognor, 4 in.; Parry Sound, 4 in.

12. Griffin Lake, 9 in.; Spence's Bridge, 5 in.

13. Thompson, 5 in.; Denbigh, 4 in.; Barkerville, 4 in.

14. Montreal, 5 in.; Parry Sound, 5 in.; Ennismore, 4 in.; Calvin, 6 in.; Burk's Falls, 4 in.; Bancroft, 5 in.; Rockliffe, 4 in.; Alexandria, 4 in.

15. St. Johns Nfld. 6 in.

16. Truro, 5 in.

17. Point Clark, 6 in.

18. Sault St. Marie, 6 in.; Sprucedale, 4 in.; Cape Magdalene, 6 in.; Ottawa, 4 in.; Parry Sd., 5 in.

19. Port Hope, 4 in.; Burk's Falls, 5 in.; Richmond 4 in.; St. Hyacinthe, 6 in.; Whiteside, .; Shannonville, 4 in.; Alexandria, 5 in.
21. Presque'Isle, 6 in.; Sault St. Marie, 8 in.; Beatrice, 7 in.; Whiteside, 7 in.; Owen Sound, 6 in.; Gravenhurst, 4 in.; St. Johns Nfld., 7 in.; Coldwater, 7 in.
22. Midland, 6 in.; Sault St. Marie, 4 in.; Durham, 12 in.
23. Midland, 4 in.; Wiarton, 8 in.; Presque Isle, 4 in.; Lucknow, 4 in.; Owen Sound, 10 in.; Cape Magdalene, 6 in.; Fort Steele, 12 in.; Chilcotin B. C., 12 in.; Saugeen, 14 in.; Bognor, 4 in.; North Bruce, 4 in.
24. Thedford, 7 in.; Coldstream, 4 in.; St. Thomas, 4 in.; Digby, 12 in.; Lucknow, 5 in.; Orillia, 4 in.; Cape Magdalene, 5 in.; Donald, 8 in.; St. Johns Nfld., 5 in.; London, 5 in.; Spence's Bridge, 4 in.
25. Wiarton, 7 in.; Coldstream, 6 in.; Wyoming, 6 in.; Presque'Isle, 14 in.; Cowal, 4 in.; Wilton Grove, 6 in.; Blenheim, 4 in.; Goderich, 8 in.; Clarkleigh, (25-26) 9 in.; Southwood 7 in.; Foxton, 6 in.; Peterboro, 5 in.; Point Clark, 10 in.; St. Mary's, 4 in.; Birnam, 10 in.; Lucknow, 10 in.; Bognor, 6 in.; Owen Sound, 4 in.; Gravenhurst, 4 in.; Chilcotin B. C., 14 in.; Saugeen 5 in.
26. Thedford, 9 in.; Coldstream, 5 in.; Sunshine, 4 in.; Rapid City, 8 in.; Cape Magdalene, 4 in.; Fort Steele, 6 in.; Donald, 5 in.; St. Johns Nfld., 6 in.; Yarmouth, 9 in.
29. St. Johns Nfld., 4 in.
30. Sault St. Marie, 31 in.; Barkerville, 4 in.
31. Barkerville, 8 in.

Thunder storms recorded at Pelee Island, Stoney Creek and St. Thomas on the 6th; at Conestogo and London on 8th and at Alexandria on the 9th.

Aurora recorded—

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV), the feeblest in brilliancy.

3. Henrietta, III; Posen, II.
4. Midland, IV; Saskatoon, Glenbow, II; Novar, III; Coldwater, II; Ottawa, IV.
5. Elkhorn, III, *bright yellow*; Channel Island, IV; Father Point, IV; Alexandria, IV.
6. Henrietta, III.
7. Channel Island, IV.
10. Oakbank, III.
11. Hillview, St. Albans, III; Henrietta, Fort Ellice, I; Channel Island, IV; Dorchester, Truro, IV.
12. Clandeboye, *very bright*, Hillview, Georgetown, St. Albans, Savanne, Fort Ellice, II; Truro, II; Elkhorn, I; Georgetown, P.E.I., Dorchester, Posen, II; Halifax, III; Medicine Hat, IV; Winnipeg, III.
13. St. Albans, III; Henrietta, III; Savanne, Fort Ellice, II; Egremont, III; Posen, II; Truro, IV; Fredericton, III.
14. Hillview, Elkhorn, I.
15. Rapid City, Hillview, Posen, I.
16. St. Albans, IV; Savanne, Channel Island, IV; Medicine Hat, IV.
17. Clandeboye, Elkhorn, IV; Posen, II; Kingston, IV.
18. St. Albans, IV; Savanne, Elkhorn, I; Channel Island, IV; Minnedosa, IV; Truro, IV; Wallace, IV.
19. Savanne, Esquimalt, IV.
20. Elkhorn, III; Minnedosa, IV; Alexandria, IV.
21. Hillview, Calvin, I; St. Albans, III; Savanne, Buda, IV; Clontarf, IV; Novar, IV; Bancroft, IV; Minnedosa, IV; Truro, IV.
22. Clandeboye, Hillview, Calvin, II; St. Albans, III; Saskatoon, III; Savanne, Buda, III; Channel Island, IV; Dorchester, Clontarf, IV; Egremont, IV; Bancroft, IV; Posen, I; Fredericton, III; St. Andrews, IV; Kingston, IV; Medicine Hat, IV; White River, IV; Alexandria, II; Truro, IV.
23. Hillview, Denbigh, II; Calvin, I; St. Albans, III; Saskatoon, IV; Savanne, Buda, IV; Gravenhurst, IV; Elkhorn, II; Channel Island, IV; Dorchester, Welland, Egremont, II; Novar, IV; Fredericton, IV; Port Arthur, II; White River, IV; Ottawa, IV.
24. Hillview, Georgetown, Henrietta, Saskatoon, IV; Elkhorn, I; White River, IV.
25. Saskatoon, IV; Egremont, III.
27. St. Albans, III; Medicine Hat, II.
28. Medicine Hat, III.
30. Fredericton, III.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF DECEMBER, 1892.

HOURS ENDING																
	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.	NOON	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.
ESQUIMALT				0 00	0 05	0 18	0 23	0 21	0 17	0 16	0 13	0 04	0 00			
AGASSIZ, B.C.				00	02	12	20	25	29	25	12	07	00			
BRANDON.....				00	02	17	24	46	55	50	39	18	00			
INDIAN HEAD.....				00	01	14	23	25	26	30	27	14	02			
WINNIPEO.....				00	17	49	55	50	49	53	53	12	00			
WOODSTOCK.....				01	08	11	12	18	19	23	16	13	05			
TORONTO.....				01	20	26	27	25	27	30	26	25	8			
LINDSAY.....				01	15	20	25	32	28	31	28	20	12			
BARRIE.....				00	02	13	23	20	23	24	16	07	00			
KINGSTON				03	23	31	31	28	32	35	35	29	01			
MONTREAL.....				00	03	19	24	26	29	25	15	03	00			
FREDERICTON				00	20	41	45	54	50	49	50	46	00			
SYDNEY				00	09	24	25	34	30	34	23	13	00			
<hr/>																
				ESQUIMALT.	AGASSIZ.	BRANDON.	INDIAN HEAD.	WINNIPEG.	WOODSTOCK.	TORONTO.	LINDSAY.	BARRIE.	KINGSTON.	MONTREAL.	FREDERICTON.	SYDNEY.
MEAN PROPORTION FOR MONTH..... (Constant sunshine being 1.)				0 13	0 16	0 32	0 19	0 41	0 14	0 24	0 24	0 12	0 27	0 19	0 42	0 22
MAXIMUM DAILY AMOUNT.....				0 78	0 68	0 84	0 87	0 86	0 89	0 89	1 00	0 70	0 90	0 84	0 90	0 74
DATE				15	4	12	2	28	1	28	28	15	28	23	18	18 22
NO. OF DAYS COMPLETELY CLOUDED.....				17	18	5	20	5	17	9	14	12	8	13	8	11

PROBABILITIES.

The probabilities issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. of the following day.

The number of predictions issued during the month was 600. These were divided as follows:—

DISTRICT.	No. ISSUED.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
MANITOBA.....	93	70	12	11	81 7
LOWER LAKE REGION.....	108	79	21	8	82 9
UPPER ST. LAWRENCE	102	83	12	7	87 3
LOWER ST. LAWRENCE.....	99	77	11	11	83 3
GULF.....	98	77	12	9	84 7
MARITIME PROVINCES	100	77	17	6	85 5
TOTAL.....	600	463	85	52	84 3

The percentage of verification is obtained by taking the sum of those fully verified and half the sum of those partly verified and dividing by the whole number.

In ascertaining the percentage of verification of the predictions, the reports from the agents at the “Probability” stations, as well as the telegraphic reports, are used.

The daily probabilities were issued by Probability Officer H. V. Payne.

STORM WARNINGS.

During the month warnings on the approach of one storm were issued to our agents, and cautionary signals duly displayed at the various signal stations on the Lakes open to navigation. The total number of warnings issued was 21, of which 21 or 100 per cent., were verified.

In connection with the warnings, predictions as to the probable direction of the winds were given, but these were only partially verified.

Signal No. 4 for a heavy westerly gale was hoisted at 11.50 a.m. on the 6th at all stations on the Lakes still open to navigation in anticipation of the approach, and development of a depression covering the Mississippi Valley and its vicinity. The depression eventually gained great energy, and during its passage over the Lakes, it gave a heavy gale generally at first from an easterly, shifting to a westerly, direction. Sarnia, Port Colborne and Cobourg, report a fresh to heavy gale, and the Toronto Island anemometer recorded east 43 miles an hour and southwest 34 miles. Signals were lowered at 11.50 p.m. on the 6th.

TORONTO OBSERVATORY, MAGNETIC REVIEW FOR DECEMBER, 1892.

The magnets remained remarkably steady until the afternoon of the 4th, when a moderate disturbance began, and continued up to the 5th. The declination magnet was east of its mean position between 8 and 10 p.m. of the 4th, during which time some rapid oscillations were registered. The disturbing force became less active after midnight, but increased again next evening. A sharp westerly swing was noticed at 7.10 p.m. At midnight a sudden increase in the movements began. The bifilar magnet felt the disturbance most. Between 8 and 10 p.m. the force was changing rapidly. After 8 p.m. a rapid decrease occurred, a marked minimum taking place at 9.07 p.m. A quick recovery then followed and the magnet attained its maximum reading a little before 10 p.m. after which it gradually resumed its normal position. The v.f. was decreased from 8 to 9 p.m. From the 6th to the afternoon of the 8th, slight disturbances were going on, and was followed by a quiet period lasting up to the 11th. Previous to the midnight observation of the latter day a little irregularity set in, and between 8 and 11 p.m. of the 12th slow waves of disturbance were going on, also next morning between 3 and 5, and a slight disturbance was maintained during the remainder of the day. A marked easterly sweep of the declination magnet took place after 9 p.m. From the 14th to the 22nd small disturbances were going on, and at 7.25 p.m. of the 22nd the declination magnet suddenly moved East 31', a gradual recovery followed, the force magnets showing very little change. From the 23rd to the end of the month a succession of small disturbances were registered, the most conspicuous movements being a westerly change of the declination magnet at 10.53 p.m. of the 24th, and an easterly one at 8.40 p.m. of the 30th followed by a gradual westerly rise.

On the 23rd appearance of auroral light (class IV.) On the 10th, 12th, 15th, 19th, 21st, 22nd, 25th, 27th, 28th and 30th the sky was clear but no auroras were observed. On all other nights clouds or haze would have hidden any aurora which might have existed.

CHARLES CARPMAEL

Director.

METEOROLOGICAL OFFICE,

Toronto, March 3rd, 1893.

P
Astron.
Can.

Author Canada. Meteorological Service

Title Monthly weather review. 1892

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